Priority #3

Access DB# 171864

SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name: Sin J. Lee Examiner #: 76060 Date: 11-15-2005
Art Unit: 1752 Phone Number 30 2-1333 Serial Number: 10/734,138
Mail Box and Bldg/Room Location: 9D60 (Rem.) Results Format Preferred (circle): PAPER DISK E-MAIL

If more than one search is submitted, please prioritize searches in order of need.

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Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: Plz. Lee Bib.

Inventors (please provide full names):

Earliest Priority Filing Date:

For Sequence Searches Only *Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.*

Plz. Search for the metal nanoparticle formed by the process claimed in Cl. #1

2004025336

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STAFF USE ONLY	Type of Search	Vendors and cost where applicable
Searcher: YCH	NA Sequence (#)	STN $1179.69
Searcher Phone #:	AA Sequence (#)	Dialog
Searcher Location:	Structure (#) 2	Questel/Orbit
Date Searcher Picked Up:	Bibliographic	Dr.Link
Date Completed: 11/22/05	Litigation	Lexis/Nexis
Searcher Prep & Review Time: 30	Fulltext	Sequence Systems
Clerical Prep Time: 30	Patent Family	WWW/Internet
Online Time: 300	Other	Other (specify)

PTO-1590 (8-01)

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

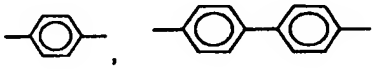
1. (Original) A photosensitive metal nanoparticle prepared by (i) forming a self-assembled monolayer of a thiol or isocyanide compound with a terminal reactive group, represented by Formula 1, on the surface of the metal nanoparticle, and then (ii) introducing a photosensitive group through the reaction with the terminal reactive group to the monolayer:

Formula 1

$X\text{-}R\text{-}(A)_a$

Wherein X- is HS- or NC-; R is a polyvalent organic group of 2-50 carbon atoms; A is -OH, -COOH, -COCl or $-NH_2$; and a is an integer of 1-4.

2. (Original) The metal nanoparticle of Claim 1, wherein the metal nanoparticle comprises gold, silver, copper, palladium, or platinum;

R of Formula 1 is polyvalent organic group of 2-50 carbon atoms, that can include -CONH-,  , -COO-, -Si-, bis-(porphyrin) and/or -CO- in its carbon chain;

the photosensitive group is an acryl group, an ethylene group, or a diazo group.

3. (Original) The metal nanoparticle of Claim 1, wherein the thiol compound is selected from the group consisting of cystamine(dihydrochloride), 6-mercapto-1-hexanol, 4,4'-thiobiphenol, 2-mercaptoethanol, 1-mercapto-2-propanol, 3-mercapto-1-propanol, 3-mercapto-2-butanol, 3-mercapto-1,2-propanediol, 2,3-dimercapto-1-propanol, dithiotheretol, dithioerythritol, 1,4-dithio-L-theretol, 3-(methylthio)-1-propanol, 4-(methylthio)-1-butanol, 3-(methylthio)-1-hexanol, 2,2'-thiodiethanol, 2-hydroxyethyl disulfide, 3,6-dithia-1,8-octanediol, 3,3'-thiodipropanol, 3-methylthio-1,2-propanediol, 3-ethylthio-1,2-propanediol, D-glucose diethyl mercaptal, 1,4-dithiane-2,5-diol, 1,5-dithiacyclooctan-3-ol, and 4-hydroxythiophenol; and

the isocyanide compound is selected from the group consisting of 4-aminobenzyl cyanide, 4-cyanophenol, and 4'-hydroxy-4-biphenylcarbonitrile.

UNITED STATES PATENT AND TRADEMARK OFFICE

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BIBDATASHEET

Bib Data Sheet

CONFIRMATION NO. 9250

SERIAL NUMBER	FILING DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
10/734,138	12/15/2003 RULE	430	1752	021269-006

APPLICANTS

Jong Jin Park, Gyeonggi-do, KOREA, REPUBLIC OF;

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Sang Yoon Lee, Seocho-Gu, KOREA, REPUBLIC OF;

** CONTINUING DATA ********** None

** FOREIGN APPLICATIONS **********
REPUBLIC OF KOREA 2003-37040 06/10/2003 SJL

IF REQUIRED, FOREIGN FILING LICENSE GRANTED
** 03/19/2004

Foreign Priority claimed ☑ yes ☐ no 35 USC 119 (a-d) conditions met ☑ yes ☐ no ☐ Met after Allowance Verified and Acknowledged Examiner's Signature SJL Initials	STATE OR COUNTRY KOREA, REPUBLIC OF	SHEETS DRAWING 0	TOTAL CLAIMS 22	INDEPENDENT CLAIMS 1	

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ALEXANDRIA , VA
22313-1404

TITLE
Photosensitive metal nanoparticle and method of forming conductive pattern using the same

FILING FEE	FEES: Authority has been given in Paper No. _____ to charge/credit DEPOSIT ACCOUNT	☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of

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=> d his ful

     (FILE 'HOME' ENTERED AT 08:45:16 ON 22 NOV 2005)

     FILE 'HCAPLUS' ENTERED AT 08:45:36 ON 22 NOV 2005
                E US20040253536/PN
L1              1 SEA ABB=ON  PLU=ON  US20040253536/PN
                D ALL
                SEL RN

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                   1068-47-9/BI OR 111-48-8/BI OR 1210-35-1/BI OR
                   122-20-3/BI OR 134-81-6/BI OR 13820-53-6/BI OR
                   15206-55-0/BI OR 1633-78-9/BI OR 16941-12-1/BI OR
                   17372-87-1/BI OR 182683-80-3/BI OR 1892-29-1/BI OR
                   1941-52-2/BI OR 196940-30-4/BI OR 19721-22-3/BI OR
                   19812-93-2/BI OR 20582-85-8/BI OR 21245-01-2/BI OR
                   21245-02-3/BI OR 2208-05-1/BI OR 22551-26-4/BI OR
                   3483-12-3/BI OR 3544-25-0/BI OR 35454-97-8/BI OR
                   40018-26-6/BI OR 471-31-8/BI OR 505-10-2/BI OR
                   51755-66-9/BI OR 5244-34-8/BI OR 54812-86-1/BI OR
                   56-17-7/BI OR 59-52-9/BI OR 60-24-2/BI OR 60763-78-2/BI
                    OR 635727-68-3/BI OR 637-89-8/BI OR 65894-76-0/BI OR
                   67362-76-9/BI OR 6892-68-8/BI OR 7447-39-4/BI OR
                   754122-42-4/BI OR 75980-60-8/BI OR 767-00-0/BI OR
                   77473-08-6/BI OR 84-11-7/BI OR 84-51-5/BI OR 86944-00-5
                   /BI OR 90-93-7/BI OR 90-94-8/BI OR 96-27-5/BI)
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                D L2 1-55 RN STR
                E 754122-42-4/RN
L3              1 SEA ABB=ON  PLU=ON  754122-42-4/RN
                D SCAN
                E 635727-68-3/RN
L4              1 SEA ABB=ON  PLU=ON  635727-68-3/RN
                D SCAN
                E 16941-12-1/RN
L5              1 SEA ABB=ON  PLU=ON  16941-12-1/RN
                D SCAN
                E 13820-53-6/RN
L6              1 SEA ABB=ON  PLU=ON  13820-53-6/RN
                D SCAN
                E 7447-39-4/RN
L7              1 SEA ABB=ON  PLU=ON  7447-39-4/RN
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                E COPPER PORPHYRIN/CN
L8              1 SEA ABB=ON  PLU=ON  "COPPER PORPHINE"/CN
                D SCAN
                D RSD
                E PALLADIUM PORPHINE/CN
L9              1 SEA ABB=ON  PLU=ON  PALLADIUM PORPHINE/CN
                D RSD
L10             1 SEA ABB=ON  PLU=ON  PLATINUM PORPHINE/CN
                D SCAN
                D RSD
                E SILVER PORPHINE/CN
                E GOLD PORPHINE/CN
                E PALLADIUM BISPORPHINE/CN
                E PALLADIUM BIS-PORPHINE/CN
                E PALLADIUM (BIS)-PORPHINE/CN
L11         51769 SEA ABB=ON  PLU=ON  9832/RID
L12            42 SEA ABB=ON  PLU=ON  L11 AND 2/PT
L13           317 SEA ABB=ON  PLU=ON  L11 AND (2/PD OR 2/AU OR 2/AG OR
                  2/CU)
L14           359 SEA ABB=ON  PLU=ON  L13 OR L12
L15           274 SEA ABB=ON  PLU=ON  L14 AND BIS

     FILE 'HCAPLUS' ENTERED AT 09:20:02 ON 22 NOV 2005
                E NANOPARTICLE/CT
                E E41+ALL
                E E23+ALL
                E NANOCHEM/CT
                E NANOA/CT
                E E62+ALL
L16        128534 SEA ABB=ON  PLU=ON  NANOPARTIC? OR NANOCRYST? OR
                  NANOCHEM? OR NANOSTRUC? OR NANOPOWDER? OR NANOCOMPOS?
                  OR NANOMAT? OR NANO(A)(PARTIC? OR CRYST? OR STRUC? OR
                  CHEM? OR POWDER? COMPOSIT? OR MAT?)
L17         12581 SEA ABB=ON  PLU=ON  (METAL? OR M)(2A)L16
L18         16003 SEA ABB=ON  PLU=ON  (GOLD OR AU OR SILVER OR AG OR
                  COPPER OR CU OR PALLADIUM OR PD OR PLATINUM OR
                  PT)(2A)L16
L19        183930 SEA ABB=ON  PLU=ON  (GOLD OR AU OR SILVER OR AG OR
                  COPPER OR CU OR PALLADIUM OR PD OR PLATINUM OR
                  PT)(2A)(HALIDE OR CHLORIDE OR CL OR BROMIDE OR BR OR
                  IODIDE OR I)
L20           581 SEA ABB=ON  PLU=ON  L19(3A)L16
L21        244642 SEA ABB=ON  PLU=ON  (GOLD OR AU OR SILVER OR AG OR
                  COPPER OR CU OR PALLADIUM OR PD OR PLATINUM OR
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                PT)(2A)(SALT? OR CATION? OR ANION? OR ION# OR COMPLEX?)

L22          547 SEA ABB=ON  PLU=ON  L21(2A)L16
L23            1 SEA ABB=ON  PLU=ON  L3
L24            2 SEA ABB=ON  PLU=ON  L4
L25         4204 SEA ABB=ON  PLU=ON  L5
L26          893 SEA ABB=ON  PLU=ON  L6
L27        13975 SEA ABB=ON  PLU=ON  L7
                 D SCAN L23
                 D SCAN L24
L28        18941 SEA ABB=ON  PLU=ON  (L23 OR L24 OR L25 OR L26 OR L27)
L29           17 SEA ABB=ON  PLU=ON  L28(3A)L16
L30         1083 SEA ABB=ON  PLU=ON  L20 OR L22
                 D QUE L18
                 D QUE L19
                 D QUE L18
                 D QUE L19
L31        25185 SEA ABB=ON  PLU=ON  L17 OR L18 OR L30 OR L29
L32              QUE ABB=ON  PLU=ON  PHOTORX## OR PHOTOREACT? OR
                 PHOTOSENS? OR PHOTOPOLYM? OR PHOTOCUR? OR PHOTOHARDEN?
                 OR PHOTOCROSS? OR PHOTOCAT?
L33              QUE ABB=ON  PLU=ON  PHOTO OR LIGHT OR PHOTOLY? OR
                 ULTRAVIOLET? OR ULTRA (W) VIOLET? OR UV# OR SUV OR LUV
                 OR RADIA? OR IRRADIA? OR EMANAT? OR EMIT? OR EMISS? OR
                 LASER?
L34          520 SEA ABB=ON  PLU=ON  L31 AND L32
L35         6020 SEA ABB=ON  PLU=ON  L31 AND L33
L36            2 SEA ABB=ON  PLU=ON  L29 AND (L32 OR L33)
                 D SCAN
L37        27962 SEA ABB=ON  PLU=ON  PHOTOLITHOG? OR PHOTO(A)LITHOG?
L38            1 SEA ABB=ON  PLU=ON  L37 AND L29
L39            2 SEA ABB=ON  PLU=ON  L36 OR L38
L40           84 SEA ABB=ON  PLU=ON  L37 AND L31
L41           39 SEA ABB=ON  PLU=ON  L37 AND (L34 OR L35)
L42            7 SEA ABB=ON  PLU=ON  L41 AND CONDUCT?
                 D SCAN
L43            1 SEA ABB=ON  PLU=ON  L39 AND CONDUCT?
                 D SCAN

    FILE 'REGISTRY' ENTERED AT 10:20:45 ON 22 NOV 2005
                 ACT LEE138/Q
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L44              SCR 1771 OR 1243
L45              STR
L46              SCR 1995 OR 2024
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L47             QUE ABB=ON  PLU=ON  L45 AND L44 NOT L46
                ---------
                ACT LEE138A/Q
                ---------
L48             SCR 1771 OR 1243
L49             STR
L50             SCR 1996 OR 2024
L51             QUE ABB=ON  PLU=ON  L49 AND L48 NOT L50
                ---------
                ACT LEE138B/Q
                ---------
L52             SCR 1771 OR 1243
L53             SCR 1995 OR 2024
L54             STR
L55             QUE ABB=ON  PLU=ON  L54 AND L52 NOT L53
                ---------
                ACT LEE138C/Q
                ---------
L56             SCR 1771 OR 1243
L57             SCR 2024 OR 1998 OR 2043 OR 2077
L58             SCR 2016
L59             STR
L60             QUE ABB=ON  PLU=ON  L59 AND L56 NOT (L57 OR L58)
                ---------
L61          50 SEA SSS SAM L49 AND L48 NOT L50
                D QUE STAT
L62          50 SEA SSS SAM L45 AND L44 NOT L46
L63             SCR 2043 OR 2077
L64          50 SEA SSS SAM L45 AND L44 NOT (L46 OR L63)
L65      248711 SEA SSS FUL L45 AND L44 NOT L46
                SAV TEMP L65 LEE138/A
                D SAV

    FILE 'LREGISTRY' ENTERED AT 11:00:34 ON 22 NOV 2005
L66             STR L45

    FILE 'REGISTRY' ENTERED AT 11:11:14 ON 22 NOV 2005
L67          50 SEA SUB=L65 SSS SAM L66
L68       29981 SEA SUB=L65 SSS FUL L66
                SAV L68 LEE138A/A

    FILE 'HCAPLUS' ENTERED AT 11:13:19 ON 22 NOV 2005
L69      242991 SEA ABB=ON  PLU=ON  L65
L70       33429 SEA ABB=ON  PLU=ON  L68
L71          17 SEA ABB=ON  PLU=ON  L70 AND L17
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L72          108 SEA ABB=ON  PLU=ON  L70 AND L31
L73           92 SEA ABB=ON  PLU=ON  L70 AND L28
L74           39 SEA ABB=ON  PLU=ON  L72 AND (L32 OR L33)
L75           21 SEA ABB=ON  PLU=ON  L73 AND (L32 OR L33)
L76            7 SEA ABB=ON  PLU=ON  L71 AND (L32 OR L33)
L77            1 SEA ABB=ON  PLU=ON  L76 AND CONDUCT?
                 D SCAN
L78            1 SEA ABB=ON  PLU=ON  L71 AND L37
L79            2 SEA ABB=ON  PLU=ON  L72 AND L37
L80          199 SEA ABB=ON  PLU=ON  (L71 OR L72 OR L73 OR L74 OR L75
                 OR L76)
L81            2 SEA ABB=ON  PLU=ON  L80 AND L37
L82           59 SEA ABB=ON  PLU=ON  (L74 OR L75 OR L76)
L83           59 SEA ABB=ON  PLU=ON  L82 AND (L32 OR L33 OR L37)
L84            4 SEA ABB=ON  PLU=ON  L83 AND CONDUCT?
L85            4 SEA ABB=ON  PLU=ON  L77 OR L84
L86            1 SEA ABB=ON  PLU=ON  L1 AND L1
L87          134 SEA ABB=ON  PLU=ON  L15
L88         1392 SEA ABB=ON  PLU=ON  (BIS OR DI)(2A)(PORPHYRIN? OR
                 PORPHIN?) OR BISPORPHYRIN? OR BISPORPHIN? OR DIPORPHYRI
                 N? OR DIPORPHIN?
L89           96 SEA ABB=ON  PLU=ON  METAL?(2A)L88 OR METALLOBISPORPHYRI
                 N OR METALLOBISPORPHIN? OR METALLODIPORPHYRIN? OR
                 METALODIPORPHIN?
L90            1 SEA ABB=ON  PLU=ON  L87 AND L16
                 D SCAN
L91            0 SEA ABB=ON  PLU=ON  L17 AND L88
L92            2 SEA ABB=ON  PLU=ON  L89 AND L16
                 D SCAN
L93            3 SEA ABB=ON  PLU=ON  L90 OR L92
L94        11367 SEA ABB=ON  PLU=ON  (SELFASSEMBL? OR SELF(A)ASSEMBL?)(2
                 A)(MONOLAYER? OR MONO(A)LAYER?)
L95          199 SEA ABB=ON  PLU=ON  (L71 OR L72 OR L73)
L96           24 SEA ABB=ON  PLU=ON  L95 AND L94
                 D QUE L31
L97          523 SEA ABB=ON  PLU=ON  L31 AND L94
L98           24 SEA ABB=ON  PLU=ON  L97 AND L70
L99          127 SEA ABB=ON  PLU=ON  L97 AND L69
L100        1479 SEA ABB=ON  PLU=ON  (L87 OR L88 OR L89)
L101           0 SEA ABB=ON  PLU=ON  L100 AND L31
L102           8 SEA ABB=ON  PLU=ON  L100 AND L16
L103           0 SEA ABB=ON  PLU=ON  L102 AND L94
L104          16 SEA ABB=ON  PLU=ON  L100 AND L94
L105           0 SEA ABB=ON  PLU=ON  L104 AND L16
L106          24 SEA ABB=ON  PLU=ON  L102 OR L104
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L107          12 SEA ABB=ON  PLU=ON  L106 AND (L31 OR L32 OR L37)
L108           4 SEA ABB=ON  PLU=ON  L107 AND L16
                 D SCAN
                 D QUE L88
L109         215 SEA ABB=ON  PLU=ON  L87 OR L89
L110           2 SEA ABB=ON  PLU=ON  L109 AND L94
L111           0 SEA ABB=ON  PLU=ON  L110 AND L16
L112           3 SEA ABB=ON  PLU=ON  L16 AND L109
                 D SCAN
L113          66 SEA ABB=ON  PLU=ON  (L82 OR L83 OR L84 OR L85 OR L86)
                 OR L93 OR L108 OR L110 OR L112
L114          44 SEA ABB=ON  PLU=ON  L113 AND L16
L115           8 SEA ABB=ON  PLU=ON  L114 AND L94
L116          10 SEA ABB=ON  PLU=ON  L113 AND L94
L117          10 SEA ABB=ON  PLU=ON  L115 OR L116
L118          44 SEA ABB=ON  PLU=ON  L114 AND (L33 OR L34 OR L37)
L119          36 SEA ABB=ON  PLU=ON  L118 NOT L117
                 D QUE STAT L118
                 D SCAN L117
                 D SCAN TI L117
                 D SCAN TI L119


=> => d que stat l118
L1             1 SEA FILE=HCAPLUS ABB=ON  PLU=ON  US20040253536/PN
L3             1 SEA FILE=REGISTRY ABB=ON  PLU=ON  754122-42-4/RN
L4             1 SEA FILE=REGISTRY ABB=ON  PLU=ON  635727-68-3/RN
L5             1 SEA FILE=REGISTRY ABB=ON  PLU=ON  16941-12-1/RN
L6             1 SEA FILE=REGISTRY ABB=ON  PLU=ON  13820-53-6/RN
L7             1 SEA FILE=REGISTRY ABB=ON  PLU=ON  7447-39-4/RN
L11        51769 SEA FILE=REGISTRY ABB=ON  PLU=ON  9832/RID
L12           42 SEA FILE=REGISTRY ABB=ON  PLU=ON  L11 AND 2/PT
L13          317 SEA FILE=REGISTRY ABB=ON  PLU=ON  L11 AND (2/PD OR
                 2/AU OR 2/AG OR 2/CU)
L14          359 SEA FILE=REGISTRY ABB=ON  PLU=ON  L13 OR L12
L15          274 SEA FILE=REGISTRY ABB=ON  PLU=ON  L14 AND BIS
L16       128534 SEA FILE=HCAPLUS ABB=ON  PLU=ON  NANOPARTIC? OR
                 NANOCRYST? OR NANOCHEM? OR NANOSTRUC? OR NANOPOWDER?
                 OR NANOCOMPOS? OR NANOMAT? OR NANO(A)(PARTIC? OR
                 CRYST? OR STRUC? OR CHEM? OR POWDER? COMPOSIT? OR
                 MAT?)
L17        12581 SEA FILE=HCAPLUS ABB=ON  PLU=ON  (METAL? OR M)(2A)L16
L18        16003 SEA FILE=HCAPLUS ABB=ON  PLU=ON  (GOLD OR AU OR SILVER
                 OR AG OR COPPER OR CU OR PALLADIUM OR PD OR PLATINUM
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```
                OR PT)(2A)L16
L19        183930 SEA FILE=HCAPLUS ABB=ON  PLU=ON  (GOLD OR AU OR SILVER
                OR AG OR COPPER OR CU OR PALLADIUM OR PD OR PLATINUM
                OR PT)(2A)(HALIDE OR CHLORIDE OR CL OR BROMIDE OR BR
                OR IODIDE OR I)
L20           581 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L19(3A)L16
L21        244642 SEA FILE=HCAPLUS ABB=ON  PLU=ON  (GOLD OR AU OR SILVER
                OR AG OR COPPER OR CU OR PALLADIUM OR PD OR PLATINUM
                OR PT)(2A)(SALT? OR CATION? OR ANION? OR ION# OR
                COMPLEX?)
L22           547 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L21(2A)L16
L23             1 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L3
L24             2 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L4
L25          4204 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L5
L26           893 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L6
L27         13975 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L7
L28         18941 SEA FILE=HCAPLUS ABB=ON  PLU=ON  (L23 OR L24 OR L25 OR
                L26 OR L27)
L29            17 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L28(3A)L16
L30          1083 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L20 OR L22
L31         25185 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L17 OR L18 OR L30 OR
                L29
L32               QUE  ABB=ON  PLU=ON  PHOTORX## OR PHOTOREACT? OR PHOTOS
                ENS? OR PHOTOPOLYM? OR PHOTOCUR? OR PHOTOHARDEN? OR PHO
                TOCROSS? OR PHOTOCAT?
L33               QUE  ABB=ON  PLU=ON  PHOTO OR LIGHT OR PHOTOLY? OR ULTR
                AVIOLET? OR ULTRA (W) VIOLET? OR UV# OR SUV OR LUV OR R
                ADIA? OR IRRADIA? OR EMANAT? OR EMIT? OR EMISS? OR LASE
                R?
L34           520 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L31 AND L32
L37         27962 SEA FILE=HCAPLUS ABB=ON  PLU=ON  PHOTOLITHOG? OR
                PHOTO(A)LITHOG?
L44               SCR 1771 OR 1243
L45               STR

G1~G2~G3          Ak @4     Cy @5                   O=C~Cl
1  2  3                                            9  @10 11

VAR G1=SH/CN
VAR G2=4/5
VAR G3=OH/N/CO2H/10
NODE ATTRIBUTES:
DEFAULT MLEVEL IS ATOM
DEFAULT ECLEVEL IS LIMITED
ECOUNT  IS M2-X50 C  AT   4
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```
ECOUNT  IS M5-X50 C  AT   5

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS   8

STEREO ATTRIBUTES: NONE
L46              SCR 1995 OR 2024
L65       248711 SEA FILE=REGISTRY SSS FUL L45 AND L44 NOT L46
L66              STR

 G1~G2~G3          Cb @4      Cb~Cb       O=C~Cl        O=C~NH
  1   2   3                   @5  @12     9  @10 11     13  @14 @15


 O=C-O         O=C
16 @17 @18    19 @20

VAR G1=SH/CN
VAR G2=SI/20/4/5-1 12-3/14-1 15-3/14-3 15-1/17-1 18-3/17-3 18-1
VAR G3=OH/N/CO2H/10
NODE ATTRIBUTES:
DEFAULT MLEVEL IS ATOM
GGCAT   IS UNS  AT   4
GGCAT   IS UNS  AT   5
GGCAT   IS UNS  AT  12
DEFAULT ECLEVEL IS LIMITED
ECOUNT  IS E6 C  AT   4
ECOUNT  IS E6 C  AT   5
ECOUNT  IS E6 C  AT  12

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS  17

STEREO ATTRIBUTES: NONE
L68        29981 SEA FILE=REGISTRY SUB=L65 SSS FUL L66
L70        33429 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L68
L71           17 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L70 AND L17
L72          108 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L70 AND L31
L73           92 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L70 AND L28
L74           39 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L72 AND (L32 OR L33)
L75           21 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L73 AND (L32 OR L33)
L76            7 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L71 AND (L32 OR L33)
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L77           1 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L76 AND CONDUCT?
L82          59 SEA FILE=HCAPLUS ABB=ON  PLU=ON  (L74 OR L75 OR L76)
L83          59 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L82 AND (L32 OR L33
                OR L37)
L84           4 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L83 AND CONDUCT?
L85           4 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L77 OR L84
L86           1 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L1 AND L1
L87         134 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L15
L88        1392 SEA FILE=HCAPLUS ABB=ON  PLU=ON  (BIS OR DI)(2A)(PORPHY
                RIN? OR PORPHIN?) OR BISPORPHYRIN? OR BISPORPHIN? OR
                DIPORPHYRIN? OR DIPORPHIN?
L89          96 SEA FILE=HCAPLUS ABB=ON  PLU=ON  METAL?(2A)L88 OR
                METALLOBISPORPHYRIN OR METALLOBISPORPHIN? OR METALLODIP
                ORPHYRIN? OR METALODIPORPHIN?
L90           1 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L87 AND L16
L92           2 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L89 AND L16
L93           3 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L90 OR L92
L94       11367 SEA FILE=HCAPLUS ABB=ON  PLU=ON  (SELFASSEMBL? OR
                SELF(A)ASSEMBL?)(2A)(MONOLAYER? OR MONO(A)LAYER?)
L100       1479 SEA FILE=HCAPLUS ABB=ON  PLU=ON  (L87 OR L88 OR L89)
L102          8 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L100 AND L16
L104         16 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L100 AND L94
L106         24 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L102 OR L104
L107         12 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L106 AND (L31 OR L32
                OR L37)
L108          4 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L107 AND L16
L109        215 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L87 OR L89
L110          2 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L109 AND L94
L112          3 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L16 AND L109
L113         66 SEA FILE=HCAPLUS ABB=ON  PLU=ON  (L82 OR L83 OR L84 OR
                L85 OR L86) OR L93 OR L108 OR L110 OR L112
L114         44 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L113 AND L16
L118         44 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L114 AND (L33 OR L34
                OR L37)


=> d l117 1-10 cbib abs hitstr hitind

L117 ANSWER 1 OF 10  HCAPLUS  COPYRIGHT 2005 ACS on STN
2005:307002  Document No. 143:15540 Surface-Enhanced Raman
     Spectroscopy of Self-Assembled
     Monolayers: Sandwich Architecture and Nanoparticle
     Shape Dependence. Orendorff, Christopher J.; Gole, Anand; Sau,
     Tapan K.; Murphy, Catherine J. (Department of Chemistry and
     Biochemistry, University of South Carolina, Columbia, SC, 29208,
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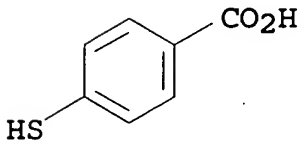
USA). Analytical Chemistry, 77(10), 3261-3266 (English) 2005. CODEN: ANCHAM. ISSN: 0003-2700. Publisher: American Chemical Society.

AB Surface enhanced Raman scattering (SERS) spectra of 4-mercaptobenzoic acid (4-MBA) **self-assembled monolayers** (SAMs) on gold substrates is presented for SAMs onto which **gold nanoparticles** of various shapes have been electrostatically immobilized. SERS spectra of 4-MBA SAMs are enhanced in the presence of immobilized **gold nanocrystals** by a factor of 107-109 relative to 4-MBA in solution Large enhancement factors are a likely result of plasmon coupling between the **nanoparticles** (localized surface plasmon) and the smooth gold substrate (surface plasmon polariton), creating large localized electromagnetic fields at their interface, where 4-MBA mols. reside in this sandwich architecture. Moreover, enhancement factors depend on **nanoparticle** shape and vary by a factor of 102. This SERS geometry offers large surface enhancements for mols. adsorbed onto planar substrates and could be quite useful for determining chemical information for poor Raman scatterers from assays on 2-D substrates.

IT **1074-36-8D**, 4-Mercaptobenzoic acid, gold bound
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(SAMs; surface-enhanced Raman spectroscopy of **self-assembled monolayers** of 4-mercaptobenzoic acid in relation to sandwich architecture and **nanoparticle** shape of **gold nanoparticles** immobilized on SAMs)

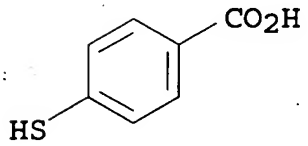
RN 1074-36-8 HCAPLUS

CN Benzoic acid, 4-mercapto- (9CI) (CA INDEX NAME)



IT **1074-36-8**, 4-Mercaptobenzoic acid
RL: PRP (Properties)
(surface-enhanced Raman spectroscopy of **self-assembled monolayers** of 4-mercaptobenzoic acid in relation to sandwich architecture and **nanoparticle** shape of **gold**

nanoparticles immobilized on SAMs)
RN 1074-36-8 HCAPLUS
CN Benzoic acid, 4-mercapto- (9CI) (CA INDEX NAME)



CC 73-3 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 22, 66
ST surface enhanced Raman spectra mercaptobenzoic acid **self assembled monolayer**; SERS mercaptobenzoic acid SAM sandwich architecture **gold nanoparticle** shape
IT **UV** and visible spectra
(absorption; of **gold nanoparticles**)
IT Surface plasmon
(coupling; surface-enhanced Raman spectroscopy of **self -assembled monolayers** of 4-mercaptobenzoic acid in relation to sandwich architecture and **nanoparticle** shape of **gold nanoparticles** immobilized on SAMs)
IT IR spectra
(near-IR, absorption; of **gold nanoparticles**)
IT Molecular vibration
Raman spectra
Vibrational frequency
(of SAMs of 4-mercaptobenzoic acid in relation to sandwich architecture and **nanoparticle** shape of **gold nanoparticles** immobilized on SAMs)
IT Surface structure
(of **gold nanoparticles**)
IT Surface plasmon
Surface polariton
(plasmon polariton, coupling; surface-enhanced Raman spectroscopy of **self-assembled monolayers** of 4-mercaptobenzoic acid in relation to sandwich architecture and **nanoparticle** shape of **gold nanoparticles** immobilized on SAMs)
IT **Nanoparticles**

Particle shape
SERS (Raman scattering)
Self-assembled monolayers
(surface-enhanced Raman spectroscopy of **self-assembled monolayers** of 4-mercaptobenzoic acid in relation to sandwich architecture and **nanoparticle** shape of **gold nanoparticles** immobilized on SAMs)

IT **1074-36-8D**, 4-Mercaptobenzoic acid, gold bound
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(SAMs; surface-enhanced Raman spectroscopy of **self-assembled monolayers** of 4-mercaptobenzoic acid in relation to sandwich architecture and **nanoparticle** shape of **gold nanoparticles** immobilized on SAMs)

IT 57-09-0, Cetyltrimethyl ammonium **bromide**
RL: PRP (Properties)
(**gold nanocrystals** capped with; surface-enhanced Raman spectroscopy of **self-assembled monolayers** of 4-mercaptobenzoic acid in relation to sandwich architecture and **nanoparticle** shape of **gold nanoparticles** immobilized on SAMs)

IT 7440-57-5, Gold, properties
RL: PRP (Properties)
(substrate, capped **nanocrystals**; surface-enhanced Raman spectroscopy of **self-assembled monolayers** of 4-mercaptobenzoic acid in relation to sandwich architecture and **nanoparticle** shape of **gold nanoparticles** immobilized on SAMs)

IT **1074-36-8**, 4-Mercaptobenzoic acid
RL: PRP (Properties)
(surface-enhanced Raman spectroscopy of **self-assembled monolayers** of 4-mercaptobenzoic acid in relation to sandwich architecture and **nanoparticle** shape of **gold nanoparticles** immobilized on SAMs)

L117 ANSWER 2 OF 10 HCAPLUS COPYRIGHT 2005 ACS on STN
2005:229113 Document No. 142:458884 Uniform Approach to Bacteriochlorophyll-Based Monolayers on Conducting, Semiconducting, and Insulating Substrates. Filip-Granit, Neta; Yerushalmi, Roie; Brandis, Alexander; Van der Boom, Milko E.; Scherz, Avigdor (Department of Plant Science, Department of

Organic Chemistry, Weizmann Institute of Science, Rehovot, 76100, Israel). Journal of Physical Chemistry B, 109(15), 6933-6935 (English) 2005. CODEN: JPCBFK. ISSN: 1520-6106. Publisher: American Chemical Society.

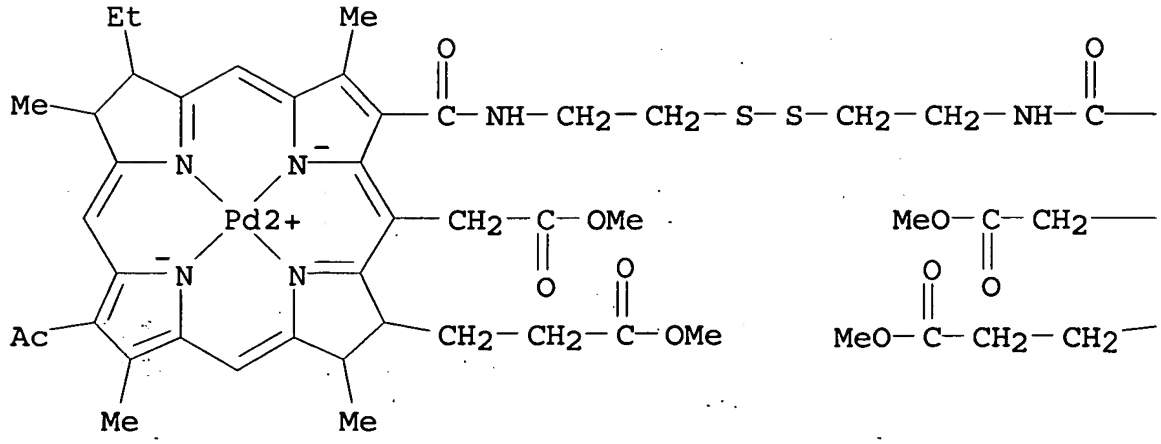
AB A general approach is demonstrated for the formation of monolayers comprised of free-base and metalated Bacteriochlorophyll-based derivs. providing a new vehicle for studying photosynthetic motifs and chromophore thin-film interactions. Accessibility to covalent and self-assembled systems on conducting, semiconducting, and insulating substrates is realized utilizing identical mol. building blocks. The monolayers retain the optical features typical for the new systems in solution Mol. organization of chromophore interaction motifs can be sequentially designed using preassembled building blocks in solution and expressed in the thin film optical properties. For instance, intramol. π-π stacking is conserved for the dimeric Ni-based chromophores as deduced from the spectroscopic measurements of the monolayers and in solution

IT **851537-05-8P**
RL: BSU (Biological study, unclassified); PRP (Properties); RCT (Reactant); SPN (Synthetic preparation); BIOL (Biological study); PREP (Preparation); RACT (Reactant or reagent)
(synthesis of functionalized free base, metal, and dimeric Bacteriochlorophyll-derivs.)

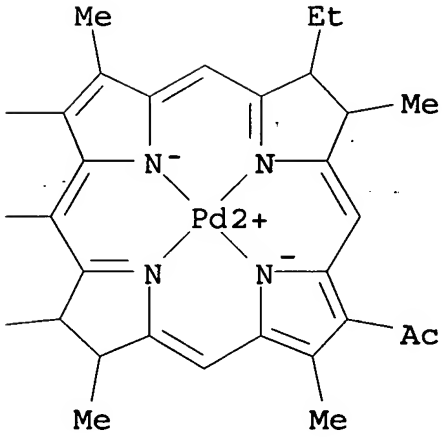
RN 851537-05-8 HCAPLUS

CN Palladium, [μ-[[dimethyl (7R,7'S,8R,8'S,17S,17'R,18S,18'R)-3,3'-[dithiobis(2,1-ethanediyliminocarbonyl)]bis[13-acetyl-18-ethyl-7,8,17,18-tetrahydro-5-(2-methoxy-2-oxoethyl)-2,8,12,17-tetramethyl-21H,23H-porphine-7-propanoato-κN21,κN22,κN23,κN24]](4-)]]di- (9CI) (CA INDEX NAME)

PAGE 1-A



PAGE 1-B



CC 6-7 (General Biochemistry)
Section cross-reference(s): 9

IT **Self-assembled monolayers**
Ultrathin films
(uniform approach to Bacteriochlorophyll-based monolayers on conducting, semiconducting, and insulating substrates)

IT 851532-73-5P 851537-03-6P **851537-05-8P** 851537-07-0P
RL: BSU (Biological study, unclassified); PRP (Properties); RCT (Reactant); SPN (Synthetic preparation); BIOL (Biological study);

PREP (Preparation); RACT (Reactant or reagent)
(synthesis of functionalized free base, metal, and dimeric Bacteriochlorophyll-derivs.)

L117 ANSWER 3 OF 10 HCAPLUS COPYRIGHT 2005 ACS on STN
2004:1080608 Document No. 142:65304 **Photosensitive metal nanoparticle** and method of forming **conductive** pattern using the same. Park, Jong Jin; Jeong, Eun Jeong; Lee, Sang Yoon (Samsung Electronics Co., Ltd., S. Korea). U.S. Pat. Appl. Publ. US 2004253536 A1 20041216, 10 pp. (English). CODEN: USXXCO. APPLICATION: US 2003-734138 20031215. PRIORITY: KR 2003-37040 20030610.

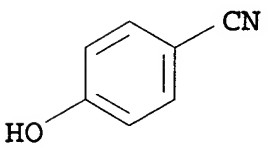
AB A **photosensitive metal nanoparticle** and a method of forming a **conductive** pattern using the same, wherein a **self-assembled monolayer** of a thiol compound or isocyanide compound having a terminal reactive group is formed on a surface of the **metal nanoparticle** and a **photosensitive** group is introduced to the terminal reactive group. The **photosensitive metal nanoparticles** can easily form a **conductive** film or pattern having excellent **conductivity** upon exposure to **UV**, and thus can be applied for antistatic washable sticky mats or shoes, **conductive** polyurethane printer rollers, electromagnetic interference shielding, etc.

IT **767-00-0**, 4-Cyanophenol
RL: RCT (Reactant); RACT (Reactant or reagent)
(isocyanide compound; **photosensitive metal nanoparticle** and method of forming **conductive** pattern)

prev.

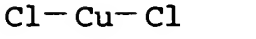
RN 767-00-0 HCAPLUS
CN Benzonitrile, 4-hydroxy- (9CI) (CA INDEX NAME)

apr.

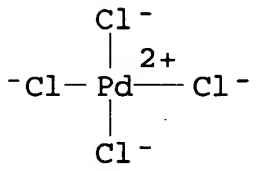


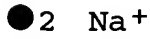
IT **7447-39-4**, Cupric chloride, reactions **13820-53-6** **16941-12-1**, Hydrogen hexachloroplatinate **635727-68-3**
RL: RCT (Reactant); RACT (Reactant or reagent)
(**photosensitive metal nanoparticle**

and method of forming **conductive** pattern)
RN 7447-39-4 HCAPLUS
CN Copper chloride (CuCl2) (8CI, 9CI) (CA INDEX NAME)

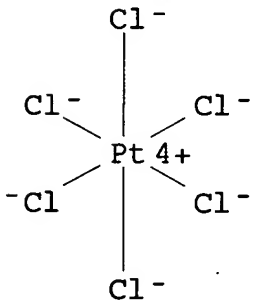


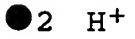
RN 13820-53-6 HCAPLUS
CN Palladate(2-), tetrachloro-, disodium, (SP-4-1)- (9CI) (CA INDEX NAME)



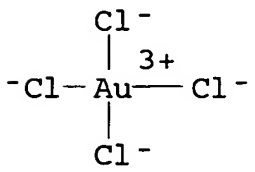


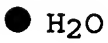
RN 16941-12-1 HCAPLUS
CN Platinate(2-), hexachloro-, dihydrogen, (OC-6-11)- (9CI) (CA INDEX NAME)



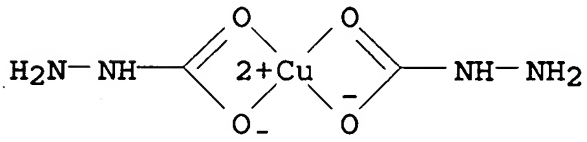


RN 635727-68-3 HCAPLUS
CN Aurate(1-), tetrachloro-, hydrogen, monohydrate, (SP-4-1)- (9CI) (CA INDEX NAME)

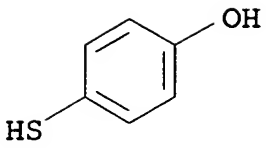




IT **754122-42-4P**
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(**photosensitive metal nanoparticle** and method of forming **conductive** pattern)
RN 754122-42-4 HCAPLUS
CN Copper, bis(hydrazinecarboxylato-O,O')- (9CI) (CA INDEX NAME)



IT **637-89-8**, 4-Hydroxythiophenol
RL: RCT (Reactant); RACT (Reactant or reagent)
(thiol compound; **photosensitive metal nanoparticle** and method of forming **conductive** pattern)
RN 637-89-8 HCAPLUS
CN Phenol, 4-mercapto- (9CI) (CA INDEX NAME)



IC ICM G03F007-004
ICS G03F007-00
INCL 430270100; 430322000
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
ST **photosensitive metal nanoparticle conductive** pattern
IT Coating materials
(**light**-sensitive; **photosensitive metal nanoparticle** and method of forming **conductive** pattern)
IT **Conducting** polymers
Nanoparticles
Photolithography
Printing apparatus
(**photosensitive metal nanoparticle** and method of forming **conductive** pattern)
IT Polyurethanes, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(**photosensitive metal nanoparticle** and method of forming **conductive** pattern)
IT 90-93-7, 4,4'-Diethylamino benzophenone 90-94-8 102-71-6, Triethanolamine, uses 105-59-9, Methyldiethanolamine 122-20-3, Triisopropanol amine 2208-05-1, 2-Dimethylamino ethylbenzoate 10287-53-3 21245-01-2 21245-02-3 67362-76-9, 2-Butoxyethyl-4-dimethylaminobenzoate
RL: CAT (Catalyst use); USES (Uses)
(co-initiator; **photosensitive metal nanoparticle** and method of forming **conductive** pattern)
IT 17372-87-1, Eosin Y
RL: CAT (Catalyst use); USES (Uses)
(eosin Y, co-initiator; **photosensitive metal nanoparticle** and method of forming **conductive** pattern)
IT **767-00-0**, 4-Cyanophenol 3544-25-0, 4-Aminobenzyl cyanide 19812-93-2, 4'-Hydroxy-4-biphenylcarbonitrile
RL: RCT (Reactant); RACT (Reactant or reagent)
(isocyanide compound; **photosensitive metal**

nanoparticle and method of forming **conductive** pattern)

IT 84-11-7, 9,10-Phenanthraquinone 84-51-5, 2-Ethylanthraquinone 134-81-6, Benzil 1210-35-1, Dibenzosuberone 10373-78-1, Camphorquinone 15206-55-0, Methyl phenyl glyoxylate 65894-76-0 75980-60-8, 2,4,6-Trimethyl benzoyl diphenyl phosphine oxide 77473-08-6 182683-80-3
RL: CAT (Catalyst use); USES (Uses)
(photoinitiator; **photosensitive metal nanoparticle** and method of forming **conductive** pattern)

IT 471-31-8, Hydrazinecarboxylic acid **7447-39-4**, Cupric chloride, reactions **13820-53-6 16941-12-1**, Hydrogen hexachloroplatinate **635727-68-3**
RL: RCT (Reactant); RACT (Reactant or reagent)
(**photosensitive metal nanoparticle** and method of forming **conductive** pattern)

IT **754122-42-4P**
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(**photosensitive metal nanoparticle** and method of forming **conductive** pattern)

IT 56-17-7, Cystamine(dihydrochloride) 59-52-9, 2,3-Dimercapto-1-propanol 60-24-2, 2-Mercaptoethanol 96-27-5, 3-Mercapto-1,2-propanediol 111-48-8, 2,2'-Thiodiethanol 505-10-2, 3-(Methylthio)-1-propanol **637-89-8**, 4-Hydroxythiophenol 1068-47-9, 1-Mercapto-2-propanol 1633-78-9, 6-Mercapto-1-hexanol 1892-29-1, 2-Hydroxyethyl disulfide 1941-52-2, D-Glucose diethyl mercaptal 3483-12-3, Dithiothreitol 5244-34-8, 3,6-Dithia-1,8-octanediol 6892-68-8, Dithioerythritol 10595-09-2, 3,3'-Thiodipropanol 19721-22-3, 3-Mercapto-1-propanol 20582-85-8, 4-(Methylthio)-1-butanol 22551-26-4, 3-Methylthio-1,2-propanediol 35454-97-8 40018-26-6, 1,4-Dithiane-2,5-diol 51755-66-9, 3-(Methylthio)-1-hexanol 54812-86-1, 3-Mercapto-2-butanol 60763-78-2, 3-Ethylthio-1,2-propanediol 86944-00-5, 1,5-Dithiacyclooctan-3-ol 196940-30-4
RL: RCT (Reactant); RACT (Reactant or reagent)
(thiol compound; **photosensitive metal nanoparticle** and method of forming **conductive** pattern)

L117 ANSWER 4 OF 10 HCAPLUS COPYRIGHT 2005 ACS on STN
2004:732634 Document No. 141:371898 Fullerene-Functionalized **Gold Nanoparticles**: Electrochemical and

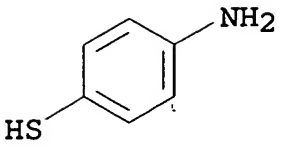
Spectroscopic Properties. Deng, Fengjun; Yang, Yiyun; Hwang, Sungho; Shon, Young-Seok; Chen, Shaowei (Department of Chemistry and Biochemistry, University of California, Santa Cruz, CA, 95064, USA). Analytical Chemistry, 76(20), 6102-6107 (English) 2004. CODEN: ANCHAM. ISSN: 0003-2700. Publisher: American Chemical Society.

AB Fullerene (C60)-tethered **Au nanoparticles** were synthesized by the coupling of the fullerene mols. with peripheral amine moieties on the particle surface. The particle composition was determined by TGA and FTIR spectroscopy. The resulting particles exhibited unique optical and electrochem. properties. **UV**-visible measurements showed that the C60 characteristic absorption remained practically invariant whereas the fluorescence demonstrated rather drastic enhancement of **emission** efficiency as compared to the behaviors of C60 monomers. Tethering of C60 on the particle surface has virtually no effect on the particle mol. capacitance when C60 is in neutral state, whereas when C60 is electroreduced, the particle effective capacitance increases drastically, reflected in the quantized capacitance charging measurements. The strong affinity of C60 to amine moieties was also exploited to assemble multilayers of C60 and **Au** particle **nanocomposite** structures. Quartz crystal microbalance measurements showed quite efficient adsorption of C60 and particles up to 2 repeated cycles. However, the voltammetric responses of the surface-confined C60 and Au particle composite structures are complicated by the inaccessibility of electrolyte counterions due to the compact nature of the surface assemblies.

IT **1193-02-8D**, 4-Aminothiophenol, gold bound with hexanethiol and aminothiophenol and reaction products with fullerene
RL: CPS (Chemical process); DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); RCT (Reactant); PROC (Process); RACT (Reactant or reagent); USES (Uses)
(electrochem. and spectroscopic properties of fullerene-functionalized **gold nanoparticles**)

RN 1193-02-8 HCAPLUS

CN Benzenethiol, 4-amino- (9CI) (CA INDEX NAME)



CC 72-2 (Electrochemistry)
Section cross-reference(s): 66, 67, 73
ST fullerene functionalized **gold nanoparticle** electrochem spectroscopic property; amino thiolated **gold nanoparticle** reaction product fullerene; voltammetry fullerene tethered **gold nanoparticle**
IT **Self-assembled monolayers**
(cyclic voltammetry of fullerene immobilized on cystamine **self-assembled monolayer** on gold in CH2Cl2 containing Bu4NClO4)
IT **Nanoparticles**
(electrochem. and spectroscopic properties of fullerene-functionalized **gold nanoparticles**)
IT Redox reaction
(electrochem.; fullerene-functionalized **gold nanoparticles**)
IT Reduction, electrochemical
(fullerene-functionalized **gold nanoparticles**)
IT Fluorescence
UV and visible spectra
(of fullerene and **gold nanoparticles** bound with hexanethiol and aminothiophenol with and without fullerene functionalization)
IT Cyclic voltammetry
Differential pulse voltammetry
(of fullerene and **gold nanoparticles** bound with hexanethiol and aminothiophenol with and without fullerene functionalization at gold electrode i.m. MeCN-toluene containing Bu4NClO4)
IT 7440-57-5, Gold, uses
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(cyclic voltammetry and differential pulsed voltammetry of fullerene and **gold nanoparticles** bound with hexanethiol and aminothiophenol with and without fullerene functionalization at gold electrode i.m. MeCN-toluene containing Bu4NClO4)

IT 1923-70-2, Tetrabutylammonium perchlorate
RL: NUU (Other use, unclassified); PRP (Properties); USES (Uses)
(cyclic voltammetry and differential pulsed voltammetry of fullerene and **gold nanoparticles** bound with hexanethiol and aminothiophenol with and without fullerene functionalization at gold electrode i.m. MeCN-toluene containing Bu4NClO4)

IT 51-85-4, Cystamine
RL: NUU (Other use, unclassified); USES (Uses)
(cyclic voltammetry of fullerene immobilized on cystamine **self-assembled monolayer** on gold in CH2Cl2 containing Bu4NClO4)

IT 111-31-9D, 1-Hexanethiol, gold bound with hexanethiol and aminothiophenol and reaction products with fullerene
1193-02-8D, 4-Aminothiophenol, gold bound with hexanethiol and aminothiophenol and reaction products with fullerene
7440-57-5D, Gold, thiolated with hexanethiol and aminothiophenol and reaction products with fullerene 99685-96-8D, Fullerene, gold bound with hexanethiol and aminothiophenol and reaction products with fullerene
RL: CPS (Chemical process); DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); RCT (Reactant); PROC (Process); RACT (Reactant or reagent); USES (Uses)
(electrochem. and spectroscopic properties of fullerene-functionalized **gold nanoparticles**)

L117 ANSWER 5 OF 10 HCAPLUS COPYRIGHT 2005 ACS on STN
2004:640736 Document No. 141:302182 Solvent-Assisted One-Pot Synthesis and Self-Assembly of 4-Aminothiophenol-Capped **Gold Nanoparticles.** Sharma, Jadab; Mahima, S.; Kakade, Bhalchandra A.; Pasricha, Renu; Mandale, A. B.; Vijayamohanan, K. (Physical and Materials Chemistry Division, Centre for Materials Characterization, National Chemical Laboratory, Pune, 411008, India). Journal of Physical Chemistry B, 108(35), 13280-13286 (English) 2004. CODEN: JPCBFK. ISSN: 1520-6106. Publisher: American Chemical Society.

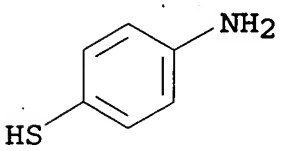
AB Single-step preparation of smaller sized (ca. 3 nm, approx. composition Au923ATP241) **gold nanoparticles** (AuNPs) followed by their self-assembly is demonstrated using 4-aminothiophenol (ATP) as a reducing agent in water/N,N-dimethylformamide (DMF). Water and DMF play a crucial role during the reduction process, since **nanoparticles** are

formed neither in water nor in DMF alone at room temperature Moreover, the morphol. of the particles is found to be strongly dependent on the pH of the medium. The instantaneous **UV**-visible absorption spectrum shows a relatively sharp peak at 550 nm, which becomes a broad band after 1 h of mixing, due to the formation of aggregates. The size of the **gold nanoparticles** is controlled in the stipulated range by maintaining a critical AuCl4-/ATP ratio. Transmission electron microscopic images reveal close-packed assembly of **gold nanoparticles** induced by the bifunctionality of ATP. Powder X-ray diffraction patterns confirm the metallic face-centered cubic (fcc) lattice structure with (111), (200), (220), and (311) crystal planes. Thermogravimetric anal. shows 22% organic mols. on the surface of AuNPs. The mol. level anal. of the as prepared **gold nanoparticles** by Fourier transform IR spectrum shows the presence of -SO stretching. X-ray photoelectron spectroscopic results also confirm the oxidation of -SH during the reduction of AuCl4- ions. The cyclic voltammograms of the monolayer-protected **Au nanoparticles** show quasi-reversible redox behavior, though the electrochem. features are different from those of the **self-assembled monolayer** (SAM) of ATP on a gold electrode.

IT **1193-02-8D**, 4-Aminothiophenol, gold bound
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process)
(synthesis and self-assembly of aminothiophenol-capped **gold nanoparticle** in water/DMF)

RN 1193-02-8 HCAPLUS

CN Benzenethiol, 4-amino- (9CI) (CA INDEX NAME)



CC 66-6 (Surface Chemistry and Colloids)
Section cross-reference(s): 78

ST synthesis self assembly aminothiophenol capped **gold nanoparticle** morphol

IT **Nanoparticles**
Self-assembly

(synthesis and self-assembly of aminothiophenol-capped **gold nanoparticle** in water/DMF)

IT Cyclic voltammetry
Microstructure
(synthesis and self-assembly of aminothiophenol-capped **gold nanoparticle** in water/DMF and its)

IT 68-12-2, N,N-Dimethylformamide, processes 7732-18-5, Water, processes
RL: PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process)
(solvent; synthesis and self-assembly of aminothiophenol-capped **gold nanoparticle** in water/DMF)

IT **1193-02-8D**, 4-Aminothiophenol, gold bound 7440-57-5D, Gold, thiolated
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process)
(synthesis and self-assembly of aminothiophenol-capped **gold nanoparticle** in water/DMF)

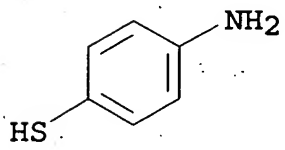
L117 ANSWER 6 OF 10 HCAPLUS COPYRIGHT 2005 ACS on STN
2004:607077 Document No. 141:285697 Chemical Lithography by **Ag-Nanoparticle**-Mediated Photoreduction of Aromatic Nitro Monolayers on Au. Kim, Kwan; Lee, Inhyung (Laboratory of Intelligent Interfaces School of Chemistry and Molecular Engineering, Seoul National University, Seoul, 151-742, S. Korea). Langmuir, 20(18), 7351-7354 (English) 2004. CODEN: LANGD5. ISSN: 0743-7463. Publisher: American Chemical Society.

AB Patterned, amine-terminated monolayers can be fabricated from 4-nitrobenzenethiol (4-NBT) monolayers simply by **irradiating** under ambient conditions with visible **laser** after spreading **Ag nanoparticles** onto selected regions of the 4-NBT monolayers on Au. **Au nanoparticles** were adsorbed selectively onto the amine groups produced by **photoreaction**, and polyaniline was found to grow exclusively at the amine groups when electrochem. polymerization was **conducted** using the patterned substrate as the working electrode. These observations clearly support our previous contention that **Ag nanoparticles** can act as moderate photoelectron **emitters**.

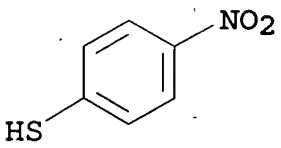
IT **1193-02-8**, 4-Aminobenzenethiol **1849-36-1**, 4-Nitrobenzenethiol
RL: PEP (Physical, engineering or chemical process); PYP (Physical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(chemical lithog. based on photoredn. of nitrobenzenethiol

monolayers on Au mediated by imagewise deposited **Ag-nanoparticles**)

RN 1193-02-8 HCAPLUS
CN Benzenethiol, 4-amino- (9CI) (CA INDEX NAME)



RN 1849-36-1 HCAPLUS
CN Benzenethiol, 4-nitro- (9CI) (CA INDEX NAME)



CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
ST **silver nanoparticle** mediated photoredn nitro monolayer chem lithog
IT Reduction, photochemical
(chemical lithog. based on photoredn. of nitrobenzenethiol monolayers on Au mediated by imagewise deposited **Ag-nanoparticles**)
IT Lithography
(chemical; chemical lithog. based on photoredn. of nitrobenzenethiol monolayers on Au mediated by imagewise deposited **Ag-nanoparticles**)
IT Polymerization
(electrochem., development; chemical lithog. based on photoredn. of nitrobenzenethiol monolayers on Au mediated by imagewise deposited **Ag-nanoparticles**)
IT **Self-assembled monolayers**
(fabrication of amine-terminated monolayers by visible **light** exposure of microcontact printed **Ag nanoparticle photocatalyst** pattern on nitrobenzenethiol monolayer)
IT Lithography

(microcontact printing; fabrication of amine-terminated monolayers by visible **light** exposure of microcontact printed **Ag nanoparticle photocatalyst** pattern on nitrobenzenethiol monolayer)

IT Reduction catalysts
(photoredn.; chemical lithog. based on photoredn. of nitrobenzenethiol monolayers on Au mediated by imagewise deposited **Ag-nanoparticles**)

IT Polyanilines
RL: PEP (Physical, engineering or chemical process); PYP (Physical process); SPN (Synthetic preparation); PREP (Preparation); PROC (Process)
(surface bound to aminebenzenethiol; fabrication of amine-terminated monolayers by visible **light** exposure of microcontact printed **Ag nanoparticle photocatalyst** pattern on nitrobenzenethiol monolayer)

IT **1193-02-8**, 4-Aminobenzenethiol **1849-36-1**, 4-Nitrobenzenethiol
RL: PEP (Physical, engineering or chemical process); PYP (Physical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(chemical lithog. based on photoredn. of nitrobenzenethiol monolayers on Au mediated by imagewise deposited **Ag-nanoparticles**)

IT 25233-30-1DP, Polyaniline, surface bound to aminebenzenethiol
RL: PEP (Physical, engineering or chemical process); PYP (Physical process); SPN (Synthetic preparation); PREP (Preparation); PROC (Process)
(fabrication of amine-terminated monolayers by visible **light** exposure of microcontact printed **Ag nanoparticle photocatalyst** pattern on nitrobenzenethiol monolayer)

IT 62-53-3, Aniline, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(fabrication of amine-terminated monolayers by visible **light** exposure of microcontact printed **Ag nanoparticle photocatalyst** pattern on nitrobenzenethiol monolayer)

IT 7440-22-4, **Silver**, processes
RL: CAT (Catalyst use); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(**nanoparticle**; chemical lithog. based on photoredn. of nitrobenzenethiol monolayers on Au mediated by imagewise deposited **Ag-nanoparticles**)

IT 7440-57-5, Gold, processes

RL: PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process)
(substrate; chemical lithog. based on photoredn. of nitrobenzenethiol monolayers on Au mediated by imagewise deposited **Ag-nanoparticles**)

IT 25233-30-1P, Polyaniline
RL: PEP (Physical, engineering or chemical process); PYP (Physical process); SPN (Synthetic preparation); PREP (Preparation); PROC (Process)
(surface bound to aminebenzenethiol; fabrication of amine-terminated monolayers by visible **light** exposure of microcontact printed **Ag nanoparticle photocatalyst** pattern on nitrobenzenethiol monolayer)

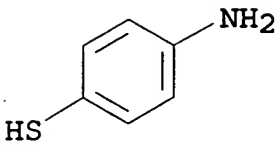
L117 ANSWER 7 OF 10 HCAPLUS COPYRIGHT 2005 ACS on STN
2003:598066 Document No. 139:283224 **Photolytic** reduction of 4-nitrobenzenethiol on Au mediated via **Ag nanoparticles.** Kim, Kwan; Lee, Inhyung; Lee, Seung Joon (School of Chemistry and Molecular Engineering and Center for Molecular Catalysis, Laboratory of Intelligent Interfaces, Seoul National University, Seoul, 151-742, S. Korea). Chemical Physics Letters, 377(1,2), 201-204 (English) 2003. CODEN: CHPLBC. ISSN: 0009-2614. Publisher: Elsevier Science B.V..

AB The authors discovered that **Ag nanoparticles** phys. in contact with organic films can induce, simply by **irradiating** with visible **laser** in ambient conditions, the **photolytic** reduction of the organic moiety, indicative of the usefulness of **Ag nanoparticles** acting as moderate photoelectron **emitter.**

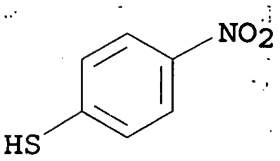
Aug. 8 2003

IT **1193-02-8**, 4-Aminobenzenethiol
RL: CPS (Chemical process); FMU (Formation, unclassified); PEP (Physical, engineering or chemical process); PYP (Physical process); FORM (Formation, nonpreparative); PROC (Process)
(photoproduct; photoredn.of **self-assembled monolayers** of nitrobenzenethiol on gold foil mediated by **silver nanoparticles** acting as photoelectron **emitters** under visible **light**)

RN 1193-02-8 HCAPLUS
CN Benzenethiol, 4-amino- (9CI) (CA INDEX NAME)



IT **1849-36-1**, 4-Nitrobenzenethiol
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PYP (Physical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(photoredn.of **self-assembled monolayers** of nitrobenzenethiol on gold foil mediated by **silver nanoparticles** acting as photoelectron **emitters** under visible **light**)
RN 1849-36-1 HCAPLUS
CN Benzenethiol, 4-nitro- (9CI) (CA INDEX NAME)



CC 74-1 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
ST photoredn nitrobenzenethiol **gold** surface **silver nanoparticle** visible **light**; photoelectron **emitter silver nanoparticle** nitrobenzenethiol photoredn visible **light**
IT Reduction catalysts
(photoredn.; photoredn.of **self-assembled monolayers** of nitrobenzenethiol on gold foil mediated by **silver nanoparticles** acting as photoelectron **emitter** under visible **light** in relation to)
IT **Nanoparticles**
Photoelectrons
Photoemission
Raman spectra
Reduction, photochemical
Self-assembled monolayers
(photoredn.of **self-assembled monolayers** of nitrobenzenethiol on gold foil mediated

by **silver nanoparticles** acting as photoelectron **emitters** under visible **light**)

IT 7440-22-4, Silver, processes
RL: CAT (Catalyst use); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(colloidal; photoredn.of **self-assembled monolayers** of nitrobenzenethiol on gold foil mediated by **silver nanoparticles** acting as photoelectron **emitters** under visible **light**)

IT **1193-02-8**, 4-Aminobenzenethiol
RL: CPS (Chemical process); FMU (Formation, unclassified); PEP (Physical, engineering or chemical process); PYP (Physical process); FORM (Formation, nonpreparative); PROC (Process)
(photoproduct; photoredn.of **self-assembled monolayers** of nitrobenzenethiol on gold foil mediated by **silver nanoparticles** acting as photoelectron **emitters** under visible **light**)

IT **1849-36-1**, 4-Nitrobenzenethiol
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PYP (Physical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(photoredn.of **self-assembled monolayers** of nitrobenzenethiol on gold foil mediated by **silver nanoparticles** acting as photoelectron **emitters** under visible **light**)

IT 7440-57-5, Gold, uses
RL: NUU (Other use, unclassified); USES (Uses)
(photoredn.of **self-assembled monolayers** of nitrobenzenethiol on gold foil mediated by **silver nanoparticles** acting as photoelectron **emitters** under visible **light**)

L117 ANSWER 8 OF 10 HCAPLUS COPYRIGHT 2005 ACS on STN
2001:544807 Document No. 135:297565 Synthesis of multi-porphyrin arrays and study of their self-assembly behaviour at the air-water interface. Foekema, Jantien; Schenning, Albertus P. H. J.; Vriezema, Dennis M.; Benneker, Franciscus B. G.; Norgaard, Kasper; Kroon, Johannes K. M.; Bjornholm, Thomas; Feiters, Martinus C.; Rowan, Alan E.; Nolte, Roeland J. M. (Department of Organic Chemistry, NSR Centre, University of Nijmegen, Nijmegen, 6525 ED, Neth.). Journal of Physical Organic Chemistry, 14(7), 501-512 (English) 2001. CODEN: JPOCEE. ISSN: 0894-3230. OTHER SOURCES: CASREACT 135:297565. Publisher: John Wiley & Sons Ltd..

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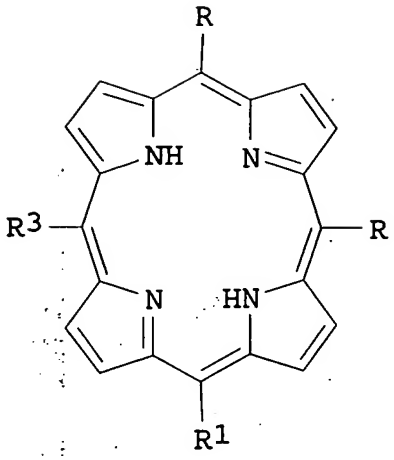


I

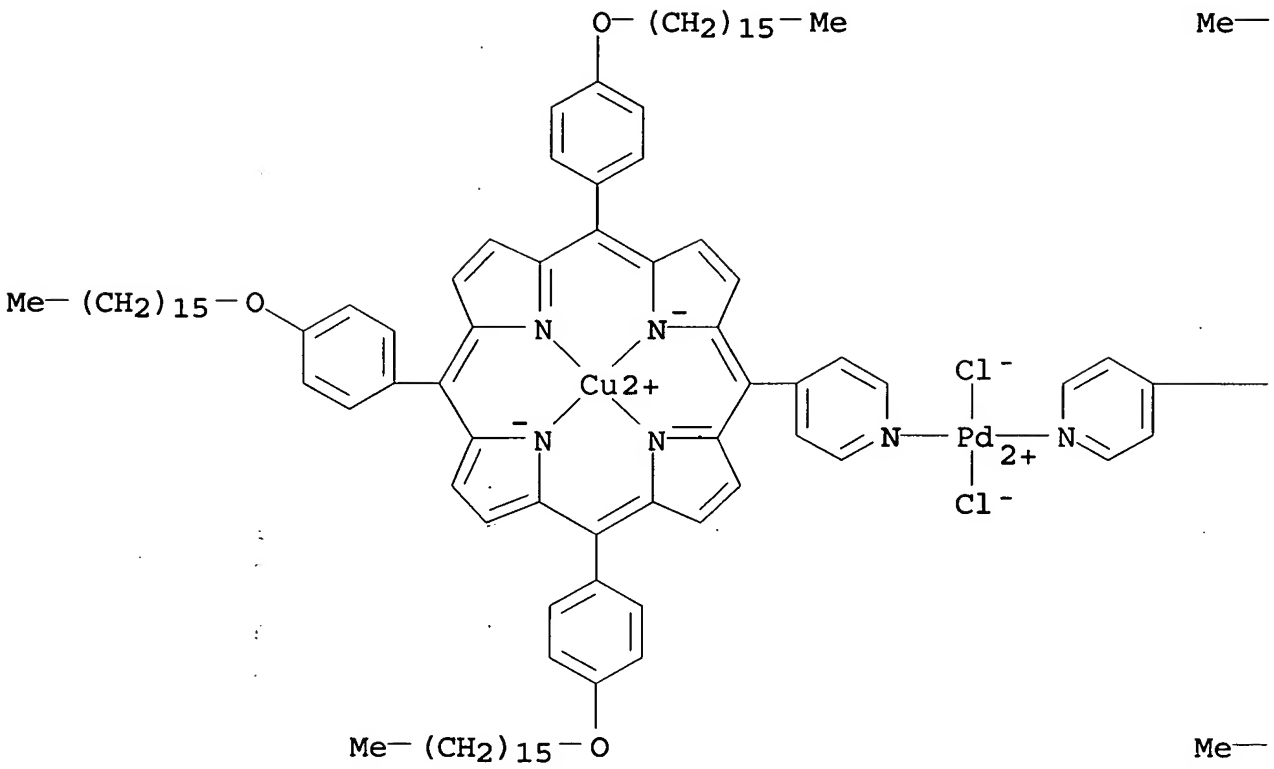
AB Multi-porphyrin arrays PdCl2L (H2L = I, R = R1 = 4-hexadecyloxyphenyl and R2 = 4-pyridyl), Pd4Cl8L14 (H2L1 = I, R = 4-hexadecyloxyphenyl and R1 = R2 = 4-pyridyl), RuCl2[PdL1]4 and Zn6L2 (H12L2 = hexakis(10,15,20-tris(4-hexadecyloxyphenyl)porphyrin-5-yl-4-phenyloxymethyl)benzene) were synthesized and the self-assembly behavior of these compds. at the air-H2O interface were studied by the Langmuir-Blodgett technique. As the overall area of the porphyrin mols. was increased, upon going from a mono- to bis- to a tetra- and then to hexaporphyrin species, the intermol. stacking between the mols. also increases, resulting in more stable monolayers. In the case of the hexaporphyrin species the intermol. interactions are so strong that monolayer formation is irreversible. All porphyrin monolayers can be transferred to a glass surface with good transfer ratios, leading to highly ordered porphyrin films in which the chromophores are arranged orthogonal to the glass surface.

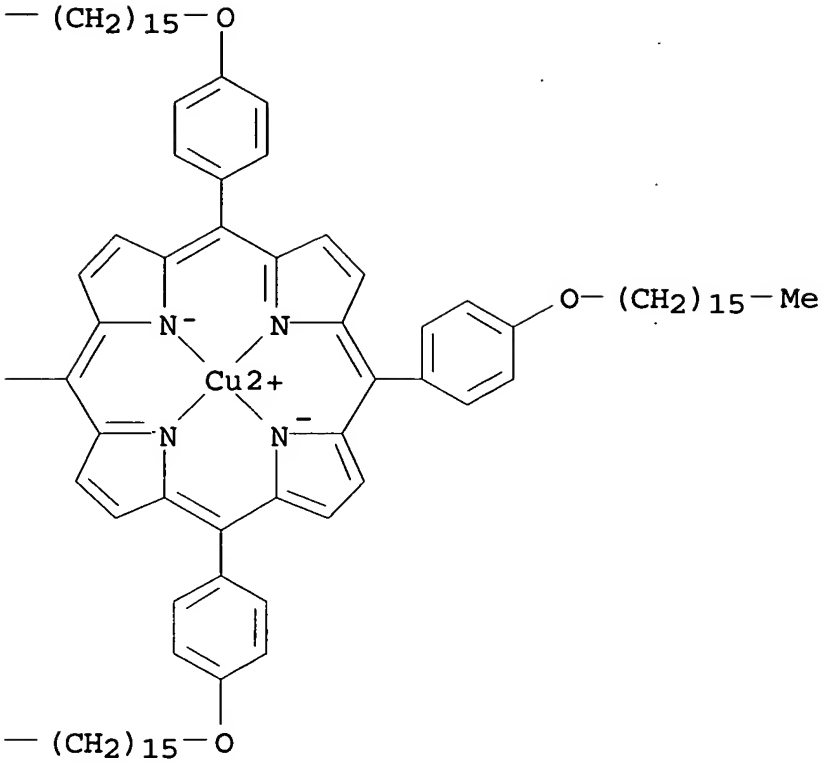
IT **364341-17-3P**
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation of)

RN 364341-17-3 HCAPLUS

CN Palladium, dichlorobis(copper)bis[μ-[5,10,15-tris[4-(hexadecyloxy)phenyl]-20-(4-pyridinyl-κN)-21H,23H-porphinato(2-)-κN21,κN22,κN23,κN24]]-, stereoisomer (9CI) (CA INDEX NAME)

PAGE 1-A





CC 78-7 (Inorganic Chemicals and Reactions)
Section cross-reference(s): 66

ST transition metal porphyrin prepn **self assembly monolayer**; film transition metal porphyrin array

IT Transition metal complexes
RL: PEP (Physical, engineering or chemical process); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); PROC (Process)
(porphyrin; preparation and **self-assembly** to **monolayers** on water with subsequent transfer to glass and stability under pressure)

IT Metalloporphyrins
RL: PEP (Physical, engineering or chemical process); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); PROC (Process)
(transition metal; preparation and **self-assembly** to **monolayers** on water with subsequent transfer to glass and stability under pressure)

IT 182181-45-9P 364629-42-5P 364629-44-7P 364629-47-0P
RL: PEP (Physical, engineering or chemical process); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); PROC (Process)
(preparation and **self-assembly** to **monolayers** on water with subsequent transfer to glass and stability under pressure)

IT 364341-13-9P
RL: PEP (Physical, engineering or chemical process); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); PROC (Process)
(preparation and **self-assembly** to **monolayers** with subsequent transfer to glass and compressibility)

IT **364341-17-3P**
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation of)

IT 216973-27-2P
RL: PEP (Physical, engineering or chemical process); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); PROC (Process)
(reactant for preparation of transition metal porphyrin arrays and **self-assembly** to **monolayers** with subsequent transfer to glass and compressibility)

IT 94846-72-7
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(**self-assembly** to **monolayers** with subsequent transfer to glass and compressibility)

L117 ANSWER 9 OF 10 HCAPLUS COPYRIGHT 2005 ACS on STN
2000:843133 Document No. 134:136966 Hetero-colloidal metal particle multilayer films grown using electrostatic interactions at the air-water interface. Sastry, Murali; Mayya, K. S. (Materials Chemistry Division, National Chemical Laboratory, Pune, 411 008, India). Journal of Nanoparticle Research, 2(2), 183-190 (English) 2000. CODEN: JNARFA. ISSN: 1388-0764. Publisher: Kluwer Academic Publishers.

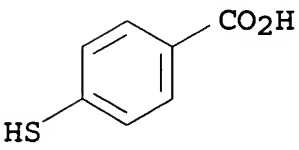
AB The formation of **nanoparticle** multilayer films by electrostatic immobilization of surface-modified colloidal particles at the air-water interface has been recently demonstrated by us. In this paper, the study is extended to show that multilayer assemblies consisting of metal particles of different chemical nature (hetero-colloidal particle superlattices) and size can be deposited by the versatile Langmuir-Blodgett

technique. Multilayer films consisting of a different number of bilayers of gold and silver colloidal particles have been deposited and characterized using quartz crystal microgravimetry and **UV**-visible spectroscopy measurements. It is observed that while layer-by-layer deposition of the different colloidal particle assemblies is possible by this technique without a detectable variation in the cluster d. in the different layers, a degree of post-deposition reorganization of the clusters occurs in the film. In addition to this aging behavior, the effect of different organic solvents on the reorganization process has also been studied.

IT **1074-36-8**, 4-Carboxythiophenol
RL: MOA (Modifier or additive use); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)
(hetero-colloidal Ag/Au particle multilayer films grown using electrostatic interactions at the air-water interface and capped with **self-assembled monolayers** of)

RN 1074-36-8 HCAPLUS

CN Benzoic acid, 4-mercapto- (9CI) (CA INDEX NAME)



CC 66-1 (Surface Chemistry and Colloids)
Section cross-reference(s): 73

ST Langmuir Blodgett multilayer air water interface electrostatic interaction; gold **silver** colloid superlattice **nanoparticle** multilayer film

IT Colloids
Langmuir-Blodgett multilayers
Nanoparticles
Particle size
(hetero-colloidal **Ag**/Au particle multilayer films grown using electrostatic interactions at the air-water interface)

IT **Self-assembled monolayers**
(hetero-colloidal Ag/Au particle multilayer films grown using electrostatic interactions at the air-water interface and capped with **self-assembled monolayers** of 4-carboxythiophenol)

IT **1074-36-8**, 4-Carboxythiophenol
RL: MOA (Modifier or additive use); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)
(hetero-colloidal Ag/Au particle multilayer films grown using electrostatic interactions at the air-water interface and capped with **self-assembled monolayers** of)

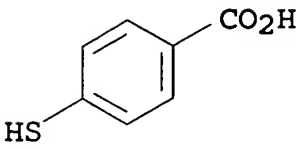
L117 ANSWER 10 OF 10 HCAPLUS COPYRIGHT 2005 ACS on STN
2000:481372 Document No. 133:199232 Sequential Electrostatic Assembly of Amine-Derivatized Gold and Carboxylic Acid-Derivatized Silver Colloidal Particles on Glass Substrates. Kumar, Ashavani; Mandale, A. B.; Sastry, Murali (Materials Chemistry Division, National Chemical Laboratory, Pune, 411 008, India). Langmuir, 16(17), 6921-6926 (English) 2000. CODEN: LANGD5. ISSN: 0743-7463. Publisher: American Chemical Society.

AB The formation of alternating layers of pos. charged gold and neg. charged silver colloidal particles on glass substrates via electrostatic interaction is described. The charging of the gold and silver colloidal particles is accomplished by self-assembly of 4-aminothiophenol (4-ATP) and 4-carboxythiophenol (4-CTP) monolayers on the colloidal particles resp. and subsequent ionization of the functional groups at appropriate pH values of the colloidal solution Glass substrates, which are neg. charged at pH > 3, are immersed first in the pos. charged amine-derivatized gold solution leading to the formation of a monolayer of the gold particles and charge reversal of the glass surface. Thereafter, the gold particle covered glass surface is immersed in the neg. charged carboxylic acid-derivatized colloidal silver solution and the silver particles electrostatically self-assembled on the glass surface. This process may be continued to yield multilayer structures of the colloidal particles. The kinetics of electrostatic self-assembly of the colloidal particles on glass, the formation of the multilayer films, and their thermal stability have been followed with **UV**-vis spectroscopy, X-ray diffraction, ellipsometry, and X-ray photoemission spectroscopy measurements.

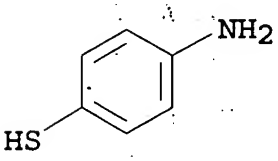
IT **1074-36-8**, 4-Carboxythiophenol **1193-02-8**, 4-Aminothiophenol
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(self-assembly; sequential electrostatic assembly of amine-derivatized gold and carboxylic acid-derivatized silver colloidal particles on glass substrates)

RN 1074-36-8 HCAPLUS

CN Benzoic acid, 4-mercapto- (9CI) (CA INDEX NAME)



RN 1193-02-8 HCAPLUS
CN Benzenethiol, 4-amino- (9CI) (CA INDEX NAME)



CC 66-4 (Surface Chemistry and Colloids)
Section cross-reference(s): 73
ST electrostatic self assembly amine acid derivatized **gold silver nanoparticle**
IT Glass substrates
Ionization
Nanoparticles
Self-assembled monolayers
Surface electric charge
UV and visible spectra
X-ray photoelectron spectra
(sequential electrostatic assembly of amine-derivatized gold and carboxylic acid-derivatized silver colloidal particles on glass substrates)
IT **1074-36-8**, 4-Carboxythiophenol **1193-02-8**, 4-Aminothiophenol
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(self-assembly; sequential electrostatic assembly of amine-derivatized gold and carboxylic acid-derivatized silver colloidal particles on glass substrates)

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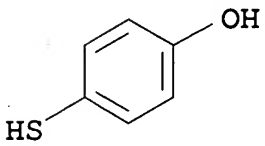
L119 ANSWER 1 OF 36 HCAPLUS COPYRIGHT 2005 ACS on STN

2005:703852 Document No. 143:355010 Substituent Effects on Redox Potentials and Optical Gap Energies of Molecule-like Au38(SPhX)24 **Nanoparticles.** Guo, Rui; Murray, Royce W. (Kenan Laboratories of Chemistry, University of North Carolina, Chapel Hill, NC, 27599-3290, USA). Journal of the American Chemical Society, 127(34), 12140-12143 (English) 2005. CODEN: JACSAT. ISSN: 0002-7863. Publisher: American Chemical Society.

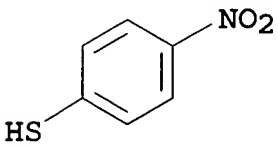
AB A mol.-like substituent effect on redox formal potentials in the **nanoparticle** series Au38(SPhX)24 was discovered. Electron-withdrawing X substituents energetically favor reduction and disfavor oxidation, and give formal potentials that correlate with Hammett substituent consts. The ligand monolayer of the **nanoparticles** is shown, thereby, to play a strong role in determining electronic energies of the **nanoparticle** core and is more than simply a protecting or capping layer. The substituent effect does not, however, detectably change the HOMO-LUMO gap energy, being identical for the HOMO and LUMO levels and presumably inductive.

IT **637-89-8D**, 4-Mercaptophenol, gold cluster bound
1849-36-1D, 4-Nitrothiophenol, gold cluster bound
RL: PRP (Properties)
(substituent effects on redox potentials and optical gap energies of mol.-like Au38(SPhX)24 **nanoparticles**)

RN 637-89-8 HCAPLUS
CN Phenol, 4-mercapto- (9CI) (CA INDEX NAME)



RN 1849-36-1 HCAPLUS
CN Benzenethiol, 4-nitro- (9CI) (CA INDEX NAME)



CC 72-2 (Electrochemistry)
Section cross-reference(s): 66, 73, 78

ST substituent effect redox potential **gold** cluster thiolated **nanoparticle**; **gold** cluster thiolated **nanoparticle** substituent effect potential optical gap

IT LUMO (molecular orbital)
(HOMO gap; of mol.-like Au38(SPhX)24 **nanoparticles** and X substituent effect)

IT HOMO (molecular orbital)
(LUMO gap; of mol.-like Au38(SPhX)24 **nanoparticles** and X substituent effect)

IT Square wave voltammetry
(Osteryoung; of mol.-like Au38(SPhX)24 **nanoparticles** in CH2Cl2 containing Bu4NClO4)

IT Cluster ions
(gold; substituent effects on redox potentials and optical gap energies of mol.-like Au38(SPhX)24 **nanoparticles**)

IT Formal potential
NMR (nuclear magnetic resonance)
Surface structure
UV and visible spectra
(of mol.-like Au38(SPhX)24 **nanoparticles** and X substituent effect)

IT Band gap
(optical; substituent effects on redox potentials and optical gap energies of mol.-like Au38(SPhX)24 **nanoparticles**)

IT **Nanoparticles**
Redox potential
Substituent effects
(substituent effects on redox potentials and optical gap energies of mol.-like Au38(SPhX)24 **nanoparticles**)

IT 1923-70-2, Tetrabutylammonium perchlorate
RL: NUU (Other use, unclassified); USES (Uses)
(Osteryoung square-wave voltammetry of mol.-like Au38(SPhX)24 **nanoparticles** in CH2Cl2 containing Bu4NClO4)

IT 140856-27-5, properties 189519-48-0, properties 764718-07-2, properties 764718-08-3, properties 865854-96-2, properties
RL: CPS (Chemical process); FMU (Formation, unclassified); PEP (Physical, engineering or chemical process); PRP (Properties); RCT (Reactant); FORM (Formation, nonpreparative); PROC (Process); RACT (Reactant or reagent)
(formal potential of Au38 **nanoparticles** in CH2Cl2 containing Bu4NClO4 and substituent effects on redox potentials and optical gap energies of mol.-like Au38(SPhX)24 **nanoparticles**)

IT 106-45-6D, p-Toluenethiol, gold cluster bound 106-53-6D, 4-Bromothiophenol, gold cluster bound **637-89-8D**,

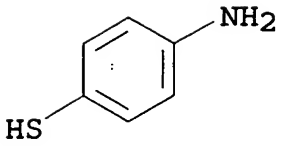
4-Mercaptophenol, gold cluster bound 696-63-9D,
4-Methoxybenzenethiol, gold cluster bound **1849-36-1D**,
4-Nitrothiophenol, gold cluster bound 4410-99-5D,
Benzeneethanethiol, gold cluster bound 189519-48-0D, thiolated,
properties
RL: PRP (Properties)
(substituent effects on redox potentials and optical gap energies of mol.-like Au38(SPhX)24 **nanoparticles**)

L119 ANSWER 2 OF 36 HCAPLUS COPYRIGHT 2005 ACS on STN
2005:655035 Document No. 143:336117 Photofragmentation of Phase-Transferred **Gold Nanoparticles** by Intense Pulsed **Laser Light.** Peng, Zhangquan; Walther, Thomas; Kleinermanns, Karl (Institute for Physical Chemistry, Heinrich-Heine-Universitaet Duesseldorf, Duesseldorf, 40225, Germany). Journal of Physical Chemistry B, 109(33), 15735-15740 (English) 2005. CODEN: JPCBFK. ISSN: 1520-6106. Publisher: American Chemical Society.

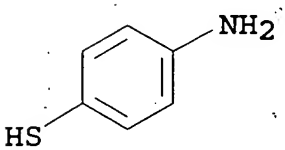
AB **Gold nanoparticles** with an average diameter of .apprx.20 nm were prepared in an aqueous solution by a wet chemical method. The parent **gold nanoparticles** were then capped with a 4-aminothiophenol protecting layer and transferred into toluene by tuning the surface charge of the modified **nanoparticles. Gold nanoparticles** before and after phase transfer were subjected to photofragmentation by a pulsed 532 nm **laser.** The effects of solvent properties and surface chemical on the photofragmentation of the **gold nanoparticles** have been investigated. Fast photofragmentation has been observed in the organic solvent in which the dielec. constant, heat capacity, and thermal **conductivity** are lower. The results suggest new approaches for the preparation of very small gold clusters from **gold nanoparticles.**

IT **1193-02-8D**, 4-Aminothiophenol, gold-bound
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process)
(**laser**-assisted size-reduction of phase transferred **Au nanoparticles** in water and toluene)

RN 1193-02-8 HCAPLUS
CN Benzenethiol, 4-amino- (9CI) (CA INDEX NAME)



IT **1193-02-8**, 4-Aminothiophenol
RL: RGT (Reagent); RACT (Reactant or reagent)
(phase-transfer reagent; **laser**-assisted size-reduction of phase transferred **Au nanoparticles** in water and toluene)
RN 1193-02-8 HCAPLUS
CN Benzenethiol, 4-amino- (9CI) (CA INDEX NAME)



CC 74-1 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
Section cross-reference(s): 66, 73
ST **laser** assisted size redn phase transferred **gold nanoparticle**; photofragmentation size redn phase transferred **gold nanoparticle**
IT Dissociative photoionization
Laser radiation
Nanoparticles
Particle size
Particle size distribution
Photolysis
Size reduction
Solvent effect
UV and visible spectra
(**laser**-assisted size-reduction of phase transferred **Au nanoparticles** in water and toluene)
IT Clusters
(metal; **laser**-assisted size-reduction of phase transferred **Au nanoparticles** in water and toluene)
IT **1193-02-8D**, 4-Aminothiophenol, gold-bound
RL: CPS (Chemical process); PEP (Physical, engineering or chemical

process); PRP (Properties); PYP (Physical process); PROC (Process)
(**laser**-assisted size-reduction of phase transferred **Au nanoparticles** in water and toluene)

IT 7440-57-5D, **Gold**, aminothiophenol-capped
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process)
(**nanoparticles**; **laser**-assisted size-reduction of phase transferred **Au nanoparticles** in water and toluene)

IT **1193-02-8**, 4-Aminothiophenol
RL: RGT (Reagent); RACT (Reactant or reagent)
(phase-transfer reagent; **laser**-assisted size-reduction of phase transferred **Au nanoparticles** in water and toluene)

IT 67-56-1, Methanol, properties 108-88-3, Toluene, properties 7732-18-5, Water, properties
RL: PRP (Properties)
(solvent effect; **laser**-assisted size-reduction of phase transferred **Au nanoparticles** in water and toluene)

L119 ANSWER 3 OF 36 HCAPLUS COPYRIGHT 2005 ACS on STN
2005:593374 Document No. 143:240757 Thiol-Functionalized Undecagold Clusters by Ligand Exchange: Synthesis, Mechanism, and Properties. Woehrle, Gerd H.; Hutchison, James E. (Department of Chemistry and Materials Science Institute, University of Oregon, Eugene, OR, 97403, USA). Inorganic Chemistry, 44(18), 6149-6158 (English) 2005. CODEN: INOCAJ. ISSN: 0020-1669. Publisher: American Chemical Society.

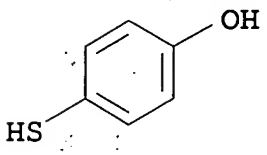
AB Ligand exchange of phosphine-stabilized undecagold precursor particles, Au11(PPh3)8Cl3, with ω-functionalized thiols provides a convenient and general approach for the rapid preparation of large families of thiol-stabilized, subnanometer (dCORE .apprx. 0.8 nm) particles. The approach permits rapid incorporation of specific functionality into the stabilizing ligand shell, is tolerant of a wide range of functional groups, and provides convenient access to new materials inaccessible by other methods. Mechanistic studies and trapping expts. give insight into the progression of the ligand exchange, providing evidence that the core size of the phosphine-stabilized undecagold precursor particles is preserved during ligand exchange. The optical properties of the thiol-stabilized **nanoparticles** depend strongly on the composition of the ligand shell, and studies suggests that this dependence is a result of the ligand shell's influence

on the electronic structure of the particle core, as opposed to a structural change within the **nanoparticle** core.

IT **637-89-8DP**, gold undecanuclear cluster complex
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(preparation and optical properties of)

RN 637-89-8 HCAPLUS

CN Phenol, 4-mercapto- (9CI) (CA INDEX NAME)



CC 78-7 (Inorganic Chemicals and Reactions)
Section cross-reference(s): 67, 73

ST gold undecanuclear cluster thiol functionalized prepn **UV** ; thiol ligand exchange **gold** phosphine precursor **nanoparticle**

IT **UV** and visible spectra
(of thiol-functionalized undecagold clusters by ligand exchange reactions of phosphine-stabilized precursor)

IT **Nanoparticles**
Substitution reaction, coordinative
(preparation and optical properties of thiol-functionalized undecagold clusters by ligand exchange reactions of phosphine-stabilized precursor)

IT 68-11-1DP, gold undecanuclear cluster complex 106-45-6DP, gold undecanuclear cluster complex 107-03-9DP, 1-Propanethiol, gold undecanuclear cluster complex 107-96-0DP, gold undecanuclear cluster complex 111-31-9DP, 1-Hexanethiol, gold undecanuclear cluster complex 111-88-6DP, 1-Octanethiol, gold undecanuclear cluster complex 112-55-0DP, 1-Dodecanethiol, gold undecanuclear cluster complex **637-89-8DP**, gold undecanuclear cluster complex 2885-00-9DP, 1-Octadecanethiol, gold undecanuclear cluster complex 2917-26-2DP, 1-Hexadecanethiol, gold undecanuclear cluster complex 4420-74-0DP, gold undecanuclear cluster complex 13242-44-9DP, gold undecanuclear cluster complex 17643-17-3DP, gold undecanuclear cluster complex 17689-17-7DP, gold undecanuclear cluster complex 19767-45-4DP, gold undecanuclear cluster complex 19813-90-2DP, [1,1'-Biphenyl]-4-thiol, gold undecanuclear cluster complex 37880-96-9DP, gold undecanuclear cluster complex 43064-23-9DP, gold undecanuclear

cluster complex 56282-36-1DP, gold undecanuclear cluster complex 82001-53-4DP, gold undecanuclear cluster complex 142081-81-0DP, gold undecanuclear cluster complex 848093-74-3DP, gold undecanuclear cluster complex
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(preparation and optical properties of)

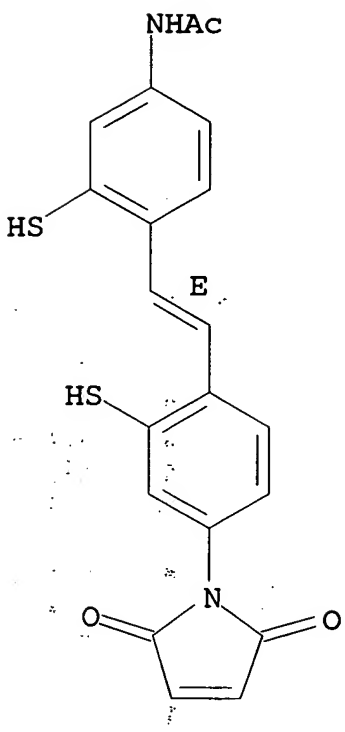
L119 ANSWER 4 OF 36 HCAPLUS COPYRIGHT 2005 ACS on STN
2005:320744 Document No. 143:34389 Fluorescence Lifetime Enhancement of Organic Chromophores Attached to **Gold Nanoparticles.** Hernandez, Florencio E.; Yu, Shenjiang; Garcia, Marisol; Campiglia, Andres D. (Department of Chemistry, University of Central Florida, Orlando, FL, 32816-2366, USA). Journal of Physical Chemistry B, 109(19), 9499-9504 (English) 2005. CODEN: JPCBFK. ISSN: 1520-6106. Publisher: American Chemical Society.

AB Exptl. evidence is presented of fluorescence lifetime enhancement of organic chromophores attached to metal nanospheres via **radiative** decay engineering. The hybrid system (HS) was a modified diconjugated mol. probe, 4-acetamido-4'-maleimidylstilbene-2,2'-dithiol (AMDT), covalently bound to the surface of 5-nm-diameter Au nanospheres by its 2 S atoms, at a distance d < 1 nm and with its mol. axis parallel to the surface of the **nanoparticle** surface. A fluorescence lifetime increase was measured of a factor of 2 at room temperature (τAMDT = 4.32 ± 0.10 ns and τHS = 8.73 ± 0.23 ns) and a factor of 3.4 at 4.2 K (τAMDT = 2.64 ± 0.07 ns and τHS = 7.96 ± 0.14 ns). The fluorescence quantum yield of this hybrid system is not reduced, proof of a weak energy transfer between the mol. probe and the **nanoparticle.** A mol. dipole oriented parallel to the metal surface tends to be reduced by the coupling with its image.

IT **853014-58-1**
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process)
(attached to **gold nanoparticles** fluorescence lifetime enhancement)

RN 853014-58-1 HCAPLUS
CN Acetamide, N-[4-[(1E)-2-[4-(2,5-dihydro-2,5-dioxo-1H-pyrrol-1-yl)-2-mercaptophenyl]ethenyl]-3-mercaptophenyl]- (9CI) (CA INDEX NAME)

Double bond geometry as shown.



CC 73-5 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 22, 66

ST fluorescence lifetime org chromophore attached **gold nanoparticle**

IT Chromophores
(attached to **gold nanoparticles** fluorescence lifetime enhancement)

IT **Nanoparticles**
(fluorescence lifetime enhancement of organic chromophores attached to gold)

IT Fluorescence decay
(lifetime enhancement of organic chromophores attached to **gold nanoparticles**)

IT Fluorescence
(of organic chromophores attached to **gold nanoparticles**)

IT **853014-58-1**
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process)
(attached to **gold nanoparticles** fluorescence lifetime enhancement)

IT 7440-57-5, Gold, uses
RL: NUU (Other use, unclassified); USES (Uses)
(fluorescence lifetime enhancement of organic chromophores attached to **nanoparticles** of)

L119 ANSWER 5 OF 36 HCAPLUS COPYRIGHT 2005 ACS on STN
2005:309390 Document No. 143:50623 **Photosensitization** of thin SnO2 **nanocrystalline** semiconductor film electrodes with electron donor-acceptor **metallodiporphyrin** dyad. Gervaldo, Miguel; Otero, Luis; Milanesio, M. Elisa; Durantini, Edgardo N.; Silber, Juana. J.; Sereno, Leonides E. (Departamento de Quimica, Universidad Nacional de Rio Cuarto, Rio Cuarto, 5800, Argent.). Chemical Physics, 312(1-3), 97-109 (English) 2005. CODEN: CMPHC2. ISSN: 0301-0104. Publisher: Elsevier B.V..

AB A electron donor-acceptor porphyrin dyad (PZn-P) was synthesized by linking an electron acceptor **porphyrin**; 5,15-**bis**(4-carboxyphenyl)-10,20-**bis**(4-nitrophenyl) **porphyrin** (P) and an electron donor porphyrin; Zn(II) 5-(4-aminophenyl)-10,15,20-tris(4-methoxylphenyl) porphyrin (PZn) by amide bond. PZn-P dyad - thin SnO2 **nanocryst.** semiconductor film electrodes show higher spectral sensitized **photocurrent** quantum yield compared to the electrodes sensitized with either PZn or P monomers. Fluorescence anal. of dyad and the P moiety adsorbed on both, SnO2 semiconductor and SiO2 insulator, shows that the charge injection yields (Φinj) from the excited dyes to the SnO2 are similar in both cases. Thus **photocurrent** enhancement is interpreted in terms of intramol. electron transfer and preferential spatial orientation of the dyad on the SnO2 surface that preclude back electron transfer.

CC 74-1 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
Section cross-reference(s): 52, 72

ST **photosensitization** tin dioxide **nanocryst** semiconductor film electrode **metallodiporphyrin** dyad; photoinduced electron transfer tin dioxide electrode **metallodiporphyrin** dyad **photosensitizer**

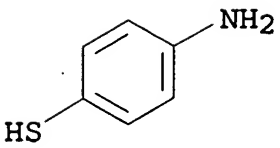
IT Electron transfer
(intramol., photochem.; **photosensitization** of SnO2 film electrodes with electron donor-acceptor **metallodiporphyrin** dyad)

IT Electron transfer
(photochem., interfacial; photoelectrochem. and **photolysis** study of **photosensitization** of SnO2 film electrodes with electron donor-acceptor

metallodiporphyrin dyad)
IT Excited singlet state
Flash **photolysis**
Oxidation potential
Photoelectrochemistry
(photoelectrochem. and **photolysis** study of **photosensitization** of SnO2 film electrodes with electron donor-acceptor **metallodiporphyrin** dyad)
IT Electron transport
(photoinduced; **photosensitization** of SnO2 film electrodes with electron donor-acceptor **metallodiporphyrin** dyad)
IT Adsorbed substances
Adsorption
Fluorescence
Photocurrent
(**photosensitization** of SnO2 film electrodes with electron donor-acceptor **metallodiporphyrin** dyad)
IT Solar cells
(**photosensitization** of SnO2 film electrodes with electron donor-acceptor **metallodiporphyrin** dyad in relation to)
IT 532384-41-1P
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); SPN (Synthetic preparation); PREP (Preparation); PROC (Process); USES (Uses)
(dyad sensitizer; photoelectrochem. and **photolysis** study of **photosensitization** of SnO2 film electrodes with electron donor-acceptor **metallodiporphyrin** dyad)
IT 18282-10-5, Tin dioxide 50926-11-9, ITO
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process); USES (Uses)
(photoelectrochem. and **photolysis** study of **photosensitization** of SnO2 film electrodes with electron donor-acceptor **metallodiporphyrin** dyad)
IT 123-31-9, Hydroquinone, uses
RL: NUU (Other use, unclassified); USES (Uses)
(photoelectrochem. study of **photosensitization** of SnO2 film electrodes with electron donor-acceptor **metallodiporphyrin** dyad)
IT 530740-02-4P 853753-98-7P
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); SPN

(Synthetic preparation); PREP (Preparation); PROC (Process); USES (Uses)
(reference sensitizer; photoelectrochem. and **photolysis** study of **photosensitization** of SnO2 film electrodes with electron donor-acceptor **metallodiporphyrin** dyad)

L119 ANSWER 6 OF 36 HCAPLUS COPYRIGHT 2005 ACS on STN
2005:289424 Document No. 142:455977 **Gold nanoparticle**-catalyzed luminol chemiluminescence and its analytical applications. Zhang, Zhi-Feng; Cui, Hua; Lai, Chun-Ze; Liu, Li-Juan (Department of Chemistry, University of Science and Technology of China, Hefei, 230026, Peop. Rep. China). Analytical Chemistry, 77(10), 3324-3329 (English) 2005. CODEN: ANCHAM. ISSN: 0003-2700. Publisher: American Chemical Society.
AB **Gold** colloids with **nanoparticles** of different sizes enhance the chemiluminescence (CL) of the luminol-H2O2 system, and the most intensive CL signals were obtained with 38-nm-diameter **gold nanoparticles. UV** -visible spectra, x-ray photoelectron spectra, and TEM studies were carried out before and after the CL reaction to study the CL enhancement mechanism. The **CL** enhancement by **gold nanoparticles** of the luminol-H2O2 system was supposed to originate from the catalysis of **gold nanoparticles**, which facilitated the radical generation and electron-transfer processes taking place on the surface of the **gold nanoparticles.** The effects of the reactant concns., the size of the **gold nanoparticles.** And some organic compds. were also studied. Organic compds. containing OH, NH2, and SH groups inhibit the CL signal of the luminol-H2O2-gold colloids system, which made it applicable for the determination of such compds.
IT **1193-02-8**, p-Aminothiophenol
RL: ARU (Analytical role, unclassified); PRP (Properties); ANST (Analytical study)
(**gold nanoparticle**-catalyzed luminol chemiluminescence and its anal. applications for organic compound anal.)
RN 1193-02-8 HCAPLUS
CN Benzenethiol, 4-amino- (9CI) (CA INDEX NAME)



CC 80-6 (Organic Analytical Chemistry)
ST **gold nanoparticle** catalysis luminol chemiluminescence analytical application
IT Luminescence, chemiluminescence
Luminescence quenching
(**gold nanoparticle**-catalyzed luminol chemiluminescence and its anal. applications for organic compound anal.)
IT Amino acids, analysis
Phenols, analysis
RL: ANT (Analyte); ANST (Analytical study)
(**gold nanoparticle**-catalyzed luminol chemiluminescence and its anal. applications for organic compound anal.)
IT 50-81-7, Ascorbic acid, analysis 51-41-2, Noradrenalin 51-43-4, Adrenalin 51-61-6, Dopamine, analysis 52-90-4, L-Cysteine, analysis 71-00-1, L-Histidine, analysis 120-80-9, Catechol, analysis
RL: ANT (Analyte); PRP (Properties); ANST (Analytical study)
(analyte; **gold nanoparticle**-catalyzed luminol chemiluminescence and its anal. applications for organic compound anal.)
IT 521-31-3, Luminol 7722-84-1, Hydrogen peroxide, uses
RL: ARG (Analytical reagent use); ANST (Analytical study); USES (Uses)
(**gold nanoparticle**-catalyzed luminol chemiluminescence and its anal. applications for organic compound anal.)
IT 7440-57-5, **Gold**, analysis
RL: ARU (Analytical role, unclassified); CAT (Catalyst use); ANST (Analytical study); USES (Uses)
(**gold nanoparticle**-catalyzed luminol chemiluminescence and its anal. applications for organic compound anal.)
IT 56-40-6, Glycine, analysis 56-41-7, L-Alanine, analysis 56-45-1, L-Serine, analysis 56-85-9, L-Glutamine, analysis 56-86-0, L-Glutamic acid, analysis 56-89-3, L-Cystine, analysis 61-90-5, L-Leucine, analysis 63-91-2, L-Phenylalanine, analysis

70-18-8, Glutathione, analysis 72-19-5, L-Threonine, analysis
73-22-3, L-Tryptophan, analysis 74-79-3, L-Arginine, analysis
87-66-1, Pyrogallol 108-46-3, Resorcinol, analysis 108-73-6,
Phloroglucinol 108-95-2, Phenol, analysis 123-31-9,
Hydroquinone, analysis 149-91-7, Gallic acid, analysis
327-97-9, Chlorogenic acid 367-51-1, Sodium thioglycolate
1193-02-8, p-Aminothiophenol
RL: ARU (Analytical role, unclassified); PRP (Properties); ANST
(Analytical study)
(**gold nanoparticle**-catalyzed luminol
chemiluminescence and its anal. applications for organic compound
anal.)

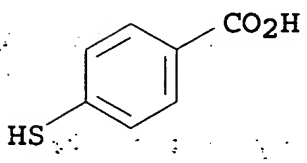
IT 16903-35-8, Tetrachloroauric acid
RL: ARU (Analytical role, unclassified); RCT (Reactant); ANST
(Analytical study); RACT (Reactant or reagent)
(**gold nanoparticle**-catalyzed luminol
chemiluminescence and its anal. applications for organic compound
anal.)

L119 ANSWER 7 OF 36 HCAPLUS COPYRIGHT 2005 ACS on STN
2005:244824 Document No. 143:121077 Preparation of Au-**Ag**
core-shell **nanoparticles** and application of bimetallic
sandwich in surface-enhanced Raman scattering (SERS). Xu,
Shuping; Zhao, Bing; Xu, Weiqing; Fan, Yuguo (Key Laboratory for
Supramolecular Structure and Materials of Ministry of Education,
Jilin University, Changchun, 130012, Peop. Rep. China). Colloids
and Surfaces, A: Physicochemical and Engineering Aspects, 257-258,
313-317 (English) 2005. CODEN: CPEAEH. ISSN: 0927-7757.
Publisher: Elsevier B.V..

AB Ag-coating **Au** colloidal **nanoparticles** have
been prepared by Ag deposition on Au core via the chemical reduction
of
AgNO3 by hydroquinone. The thickness of Ag shell depends on the
Au-Ag molar ratio and the reducing time, which were monitored by
the **UV**-vis spectrometry and TEM. A Raman-active
4-mercaptobenzoic acid (MBA) was adsorbed onto the surface of 16
nm-diameter Au core, and then a 3 nm-thick Ag shell coats the MBA
modified Au core to form a Au/MBA/Ag sandwich structure.
Surface-enhanced Raman scattering spectra show that, in the
sandwich structure, 3 nm-thick Ag shell can effectively enhance
the SERS signal of MBA. This is probably caused by the
electromagnetic coupling of the Au-Ag double metallic layers.

IT **1074-36-8**, 4-Mercaptobenzoic acid
RL: MOA (Modifier or additive use); PRP (Properties); USES (Uses)
(preparation of Au-**Ag** core-shell **nanoparticles**

and application of bimetallic sandwich in surface-enhanced Raman scattering)
RN 1074-36-8 HCAPLUS
CN Benzoic acid, 4-mercapto- (9CI) (CA INDEX NAME)



CC 66-4 (Surface Chemistry and Colloids)
Section cross-reference(s): 73
ST gold **silver** core shell **nanoparticle** prepn SERS application
IT Thickness
(of shell; preparation of Au-**Ag** core-shell **nanoparticles** and application of bimetallic sandwich in surface-enhanced Raman scattering)
IT **Nanocomposites**
Nanoparticles
SERS (Raman scattering)
Sols
(preparation of **Au-Ag** core-shell **nanoparticles** and application of bimetallic sandwich in surface-enhanced Raman scattering)
IT 68-04-2, Trisodium citrate 123-31-9, Hydroquinone, processes 7761-88-8, Silver nitrate, processes 16903-35-8, Hydrogen tetrachloroaurate
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(preparation of Au-**Ag** core-shell **nanoparticles** and application of bimetallic sandwich in surface-enhanced Raman scattering)
IT **1074-36-8**, 4-Mercaptobenzoic acid
RL: MOA (Modifier or additive use); PRP (Properties); USES (Uses)
(preparation of Au-**Ag** core-shell **nanoparticles** and application of bimetallic sandwich in surface-enhanced Raman scattering)
IT 7440-22-4P, Silver, properties 7440-57-5P, Gold, properties
RL: NUU (Other use, unclassified); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(preparation of Au-**Ag** core-shell **nanoparticles** and application of bimetallic sandwich in surface-enhanced

Raman scattering)

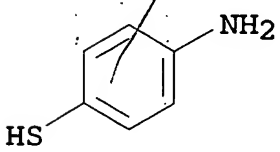
L119 ANSWER 8 OF 36 HCAPLUS COPYRIGHT 2005 ACS on STN
2005:201181 Document No. 143:116103 Energy transfer in **gold nanoparticles** capped with α-functionalized thiophene dendrons. Deng, Suxiang; Baba, Akira; Locklin, Jason; Advincula, Rigoberto C. (Department of Chemistry, University of Houston, Houston, TX, 77204-5003, USA). Polymer Preprints (American Chemical Society, Division of Polymer Chemistry), 46(1), 641-642 (English) 2005. CODEN: ACPPAY. ISSN: 0032-3934. Publisher: American Chemical Society, Division of Polymer Chemistry.

AB Thiophene dendrons cysteamine-functionalized terthiophene (Thiol-1) and aminothiophenol-functionalized terthiophene (Thiol-2), were combined with well-established organosulfur surface chemical to effect surface modification of **gold nanoparticles** with fluorophore moieties. Self assembly of α-functionalized thiophene dendrons on flat gold substrates as a model system for **nanoparticle** surface modification was studied in-situ by surface plasmon spectroscopy (SPS). **Nanoparticles** were then surface-modified by ligand exchange. Changes in optical properties were studied by **UV**-vis and fluorescence spectra that indicate that Thiol-2 is a better capping ligand than Thiol-1.

IT **1193-02-8**, 4-Aminothiophenol
RL: RCT (Reactant); RACT (Reactant or reagent)
(energy transfer in **gold nanoparticle complexes** with α-thiol-amine thiophene dendron ligands prepared via surface functionalization)

RN 1193-02-8 HCAPLUS

CN Benzenethiol, 4-amino- (9CI) (CA INDEX NAME)



CC 37-5 (Plastics Manufacture and Processing)
Section cross-reference(s): 73

ST **gold nanoparticle** surface functionalization thiophene dendron ligand exchange

IT Fluorescence
Optical absorption
Photoinduced energy transfer

Self-assembly
Substitution reaction, coordinative
(energy transfer in **gold nanoparticle complexes** with α-thiol-amine thiophene dendron ligands prepared via surface functionalization)

IT 60-23-1DP, Cysteamine, gold complexes 857630-98-9DP, gold complexes 857630-99-0DP, gold complexes
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(energy transfer in **gold nanoparticle complexes** with α-thiol-amine thiophene dendron ligands prepared via surface functionalization)

IT 60-23-1, Cysteamine **1193-02-8**, 4-Aminothiophenol 10294-29-8, Gold chloride (AuCl) 705240-03-5
RL: RCT (Reactant); RACT (Reactant or reagent)
(energy transfer in **gold nanoparticle complexes** with α-thiol-amine thiophene dendron ligands prepared via surface functionalization)

IT 334-48-5DP, Decanoic acid, gold complexes
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(energy transfer in **gold nanoparticle complexes** with α-thiol-amine thiophene dendron ligands prepared via surface functionalization)

IT 33725-74-5, Tetrabutylammonium borohydride
RL: RGT (Reagent); RACT (Reactant or reagent)
(energy transfer in **gold nanoparticle complexes** with α-thiol-amine thiophene dendron ligands prepared via surface functionalization)

IT 3282-73-3, Didodecyldimethylammonium bromide
RL: NUU (Other use, unclassified); USES (Uses)
(**nanoparticle** template; energy transfer in **gold nanoparticle complexes** with α-thiol-amine thiophene dendron ligands prepared via surface functionalization)

IT 7440-57-5DP, Gold, complexes with decanoic acid and with cysteamine and with thiol-functionalized thiophene dendrons
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(**nanoparticles** and flat substrates; energy transfer in **gold nanoparticle complexes** with α-thiol-amine thiophene dendron ligands prepared via surface functionalization)

IT 857630-98-9P 857630-99-0P
RL: SPN (Synthetic preparation); PREP (Preparation)

(thiol ligand; energy transfer in **gold nanoparticle complexes** with α-thiol-amine thiophene dendron ligands prepared via surface functionalization)

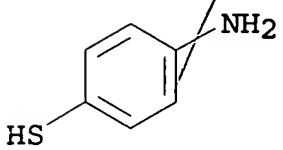
L119 ANSWER 9 OF 36 HCAPLUS COPYRIGHT 2005 ACS on STN
2005:37926 Document No. 142:287104 Surface-enhanced Raman scattering on tunable plasmonic **nanoparticle** substrates. Jackson, J. B.; Halas, N. J. (Departments of Physics and Astronomy, Rice University, Houston, TX, 77005, USA). Proceedings of the National Academy of Sciences of the United States of America, 101(52), 17930-17935 (English) 2004. CODEN: PNASA6. ISSN: 0027-8424. Publisher: National Academy of Sciences.

AB Au and Ag nanoshells are studied as substrates for surface-enhanced Raman scattering (SERS). SERS enhancements on nanoshell films are dramatically different from those observed on colloidal aggregates, specifically that the Raman enhancement follows the plasmon resonance of the individual **nanoparticles.** Comparative finite difference time domain calcns. of fields at the surface of smooth and roughened nanoshells reveal that surface roughness contributes only slightly to the total enhancement. SERS enhancements as large as 2.5 + 1010 on Ag nanoshell films for the nonresonant mol. p-mercaptoaniline are measured.

IT **1193-02-8**, p-Mercaptoaniline
RL: PRP (Properties)
(p-mercaptoaniline SERS on tunable plasmonic **Au** and **Ag nanoparticle** substrates)

RN 1193-02-8 HCAPLUS

CN Benzenethiol, 4-amino- (9CI) (CA INDEX NAME)



CC 73-3 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 66

IT **Nanoparticles**
(nanoshells; p-mercaptoaniline SERS on tunable plasmonic **Au** and **Ag nanoparticle** substrates)

IT **UV** and visible spectra

(of poly(4-vinylpyridine)/Au nanoshell films)
IT Adsorbed substances
Plasmon
SERS (Raman scattering)
(p-mercaptoaniline SERS on tunable plasmonic **Au** and **Ag nanoparticle** substrates)
IT Surface roughness
(p-mercaptoaniline SERS on tunable plasmonic **Au** and **Ag nanoparticle** substrates in dependence on)
IT Glass, uses
RL: NUU (Other use, unclassified); USES (Uses)
(p-mercaptoaniline SERS on tunable plasmonic **Au** and **Ag nanoparticle** substrates on poly(4-vinylpyridine)-functionalized glass)
IT **1193-02-8**, p-Mercaptoaniline 7440-22-4, Silver, properties 7440-57-5, Gold, properties
RL: PRP (Properties)
(p-mercaptoaniline SERS on tunable plasmonic **Au** and **Ag nanoparticle** substrates)
IT 25232-41-1, Poly(4-vinylpyridine)
RL: NUU (Other use, unclassified); USES (Uses)
(p-mercaptoaniline SERS on tunable plasmonic **Au** and **Ag nanoparticle** substrates on poly(4-vinylpyridine)-functionalized glass)
IT 7631-86-9, Silica, uses
RL: NUU (Other use, unclassified); USES (Uses)
(p-mercaptoaniline SERS on tunable plasmonic **Au** and **Ag nanoparticle** substrates on poly(4-vinylpyridine)-functionalized silica)

L119 ANSWER 10 OF 36 HCAPLUS COPYRIGHT 2005 ACS on STN
2004:573224 Document No. 141:263314 Supramolecular photovoltaic cells using porphyrin dendrimers and fullerenes. Hasobe, Taku; Kashiwagi, Yukiyasu; Absalom, Mark A.; Sly, Joseph; Hosomizu, Kohei; Crossley, Maxwell J.; Imahori, Hiroshi; Kamat, Prashant V.; Fukuzumi, Shunichi (Radiation Laboratory and Department of Chemical & Biomolecular Engineering, University of Notre Dame, Notre Dame, IN, 46556, USA). Advanced Materials (Weinheim, Germany), 16(12), 975-979 (English) 2004. CODEN: ADVMEW. ISSN: 0935-9648. Publisher: Wiley-VCH Verlag GmbH & Co. KGaA.
AB Various types of dendrimers have been developed resembling the **light**-harvesting antenna LH-2 system of photosynthetic purple bacteria. A combination of both porphyrin dendrimer (electron donor) and fullerenes (electron acceptor) seems ideal for fulfilling an enhanced **light**-harvesting efficiency

of bulk heterojunction solar cells. The authors report a photoenergy conversion system using supramol. complexes of porphyrin dendrimers with fullerene by clusterization in a mixed solvent on **nanostructured** SnO2 electrodes. The clusters were attached on **nanostructured** SnO2 electrodes by an electrophoretic deposition method. The solution concns. in acetonitrile/toluene enabled the authors to achieve complex formation between the porphyrin dendrimers and C60 and clusterization at the same time. TEM images of the clusters and absorption spectra in acetonitrile/toluene solution are reported. The dendritic structure plays a part in the self-association behavior. Solar cells were assembled using I2 and NaI in acetonitrile, and the **photocurrent**, photovoltage, and **photocurrent** action spectra were measured, yielding an overall power conversion efficiency of about 0.32 - 0.35%, with exceptional efficiency (4-15%, depending on the dendrimer) in the range 500-700 nm.

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 27, 76

IT Clusters
Heterojunction solar cells
Open circuit potential
Photocurrent
Photovoltage
Self-assembly
(supramol. photovoltaic cells using porphyrin dendrimers and fullerenes as electron acceptor-donor complexes)

IT 89372-90-7D, 5,10,15,20-Tetrakis(3,5-**di**-tert-butylphenyl)**porphyrin**, complexes with fullerene C60
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(H2ref, reference porphyrin, complexes and clusters with fullerene C60; supramol. photovoltaic cells using porphyrin dendrimers and fullerenes as electron acceptor-donor complexes)

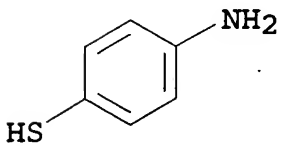
IT 107-13-1DP, 2-Propenenitrile, hydrogenated, Michael-addition dendrimers, reaction products with 2,5-dioxopyrrolidin-1-yl-5-[amino-2-[5,10,15,20-tetrakis(3,5-**di**-tert-butylphenyl)]**porphyrin** -5-oxxxx, complexes with fullerene C60
RL: DEV (Device component use); PRP (Properties); PUR (Purification or recovery); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(Poly(propylenimine), clusters with fullerene C60; supramol. photovoltaic cells using porphyrin dendrimers and fullerenes as electron acceptor-donor complexes)

L119 ANSWER 11 OF 36 HCAPLUS COPYRIGHT 2005 ACS on STN
2004:308883 Document No. 141:44029 Electrochemical Assembly of a CdS Semiconductor **Nanoparticle** Monolayer on Surfaces: Structural Properties and Photoelectrochemical Applications. Granot, Eran; Patolsky, Fernando; Willner, Itamar (Institute of Chemistry, The Farkas Center for Light-Induced Processes, The Hebrew University of Jerusalem, Jerusalem, 91904, Israel). Journal of Physical Chemistry B, 108(19), 5875-5881 (English) 2004. CODEN: JPCBFK. ISSN: 1520-6106. Publisher: American Chemical Society.

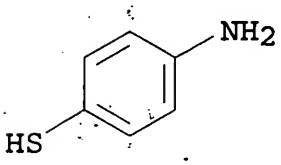
AB P-Aminothiophenol-capped CdS **nanoparticles** (8.5 ± 0.3 nm) were assembled as a monolayer by their electropolymn. into a p-aminothiophenol-monolayer-functionalized Au electrode. The resulting CdS **nanoparticle** monolayer, 9.0 + 1011 particles/cm2, was characterized by AFM, XPS, and microgravimetric quartz crystal microbalance measurements. The dianiline-bridged CdS **nanoparticles** assembled on the Au electrode revealed highly efficient photoelectrochem. properties in the presence of triethanolamine as sacrificial electron donor. The dianiline bridging unit has an important function in the **photocurrent** generation. At an applied potential that is more pos. than -0.1 V, the dianiline exists in its oxidized state, and it acts as an electron relay that mediates electron transfer from the semiconductor to the bulk electrode. The quantum yield at an applied potential of 0.4 V corresponds to ϕ = 5.7%. At an applied potential of <-0.1 V the polymer exists in its reduced state, and under these conditions the dianiline units act as a tunneling medium for transporting the electrons from the semiconductor **nanoparticles** to the electrode.

IT **1193-02-8**, p-Aminothiophenol
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(electrochem. assembly of aminothiophenol/mercaptoethanesulfonic acid functionalized CdS **nanoparticle** on aminothiophenol-modified Au electrode and structural properties and photoelectrochem. applications)

RN 1193-02-8 HCAPLUS
CN Benzenethiol, 4-amino- (9CI) (CA INDEX NAME)



IT **1193-02-8D**, p-Aminothiophenol, gold bound
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(electrochem. assembly of aminothiophenol/mercaptoethanesulfonic acid functionalized CdS **nanoparticle** on aminothiophenol-modified Au electrode and structural properties and photoelectrochem. applications)
RN 1193-02-8 HCAPLUS
CN Benzenethiol, 4-amino- (9CI) (CA INDEX NAME)



CC 72-2 (Electrochemistry)
Section cross-reference(s): 66, 76
ST electrochem assembly cadmium sulfide semiconductor **nanoparticle** monolayer surface; gold electrode modified aminothiophenol; mercaptoaniline capped cadmium sulfide **nanoparticle** electropolymn; photoelectrochem application aminothiophenol functionalized cadmium sulfide **nanoparticle gold**
IT Chemically modified electrodes
(CdS **nanoparticle**-modified **gold**)
IT **Nanoparticles**
(electrochem. assembly of aminothiophenol/mercaptoethanesulfonic acid functionalized CdS **nanoparticle** on aminothiophenol-modified Au electrode and structural properties and photoelectrochem. applications)
IT Dimerization
(electrochem.; in electrochem. assembly of aminothiophenol/mercaptoethanesulfonic acid functionalized CdS **nanoparticle** on aminothiophenol-modified Au electrode)
IT Polymerization
(electrochem.; of mercaptoaniline-capped CdS **nanoparticles** on **gold** electrode in monolayer assembly)
IT **Photocurrent**
(of CdS **nanoparticle**-modified **gold** electrodes in phosphate buffer containing triethanolamine)
IT Surface structure
(of aminothiophenol-modified **Au** and CdS

nanoparticle-modified **gold** electrodes)
IT **UV** and visible spectra
(of aminothiophenol/mercaptoethanesulfonic acid capped CdS **nanoparticles**)
IT Cyclic voltammetry
(of cross-linked CdS **nanoparticle** monolayer on **gold** electrodes in phosphate solution)
IT 1306-23-6, Cadmium sulfide, uses 7440-57-5, Gold, uses
RL: CPS (Chemical process); DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)
(electrochem. assembly of aminothiophenol/mercaptoethanesulfonic acid functionalized CdS **nanoparticle** on aminothiophenol-modified Au electrode and structural properties and photoelectrochem. applications)
IT **1193-02-8**, p-Aminothiophenol 3375-50-6, 2-Mercaptoethanesulfonic acid
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(electrochem. assembly of aminothiophenol/mercaptoethanesulfonic acid functionalized CdS **nanoparticle** on aminothiophenol-modified Au electrode and structural properties and photoelectrochem. applications)
IT **1193-02-8D**, p-Aminothiophenol, gold bound
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(electrochem. assembly of aminothiophenol/mercaptoethanesulfonic acid functionalized CdS **nanoparticle** on aminothiophenol-modified Au electrode and structural properties and photoelectrochem. applications)
IT 7440-57-5D, Gold, thiolated
RL: DEV (Device component use); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)
(electrochem. assembly of aminothiophenol/mercaptoethanesulfonic acid functionalized CdS **nanoparticle** on aminothiophenol-modified Au electrode and structural properties and photoelectrochem. applications)
IT 102-71-6, Triethanolamine, uses
RL: NUU (Other use, unclassified); PRP (Properties); USES (Uses)
(**photocurrent** of CdS **nanoparticle**-modified **gold** electrodes in phosphate buffer containing triethanolamine)
IT 51-85-4, Cystamine
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(**photocurrent** of cystamine/mercaptoethanesulfonic acid-functionalized CdS **nanoparticles** covalently

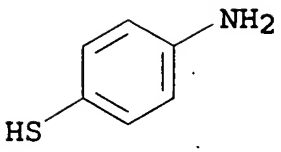
linked to Au electrode)

L119 ANSWER 12 OF 36 HCAPLUS COPYRIGHT 2005 ACS on STN
2004:194312 Document No. 141:29178 Tuning the aspect ratio of **silver nanostructures**: the effect of solvent mole fraction and 4-aminothiophenol concentration. Sharma, Jadab; Chaki, Nirmalya K.; Mahima, Subhramannia; Gonnade, Rajesh G.; Mulla, Imtiaz S.; Vijayamohanan, Kunjukrishna (Physical Chemistry Division, National Chemical Laboratory, Pune, 411008, India). Journal of Materials Chemistry, 14(6), 970-975 (English) 2004. CODEN: JMACEP. ISSN: 0959-9428. Publisher: Royal Society of Chemistry.

AB In this report, we study the role of solvent on controlling the aspect ratio of **silver nanostructures** during their growth. More specifically, a single-step preparation of different aspect ratio **silver nanostructures** (R, 1-100) is demonstrated in aqueous acetonitrile using 4-aminothiophenol (ATP) as a reducing as well as surface passivating agent, where the variation of the mole fraction of acetonitrile has a dramatic effect on the morphol. The combined effect of ATP concentration and solvent mole fraction on aspect ratio is investigated by **UV**-Visible Spectroscopy (**UV**-Vis), Transmission Electron Microscopy (TEM), Fourier Transform Infra-red Spectroscopy (FTIR) and X-ray Diffraction anal. (XRD). At lower values of mole fraction (i.e. 0.4), high aspect ratio silver nanorods are formed, whereas a mole fraction close to 1 gives no such **nanostructures**. In comparison, only spherical **nanoparticles** are formed when the mole fraction is close to 0. High aspect ratio silver nanorods are also favored by higher ATP concentration

IT **1193-02-8**, 4-Aminothiophenol
RL: PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process)
(effect of solvent mole fraction and 4-aminothiophenol concentration on morphol. of **silver nanoparticle**)

RN 1193-02-8 HCAPLUS
CN Benzenethiol, 4-amino- (9CI) (CA INDEX NAME)



CC 66-6 (Surface Chemistry and Colloids)
Section cross-reference(s): 78
ST acetonitrile aminothiophenol morphol **silver nanostructure nanoparticle**
IT Microstructure
Nanoparticles
Nanostructures
(effect of solvent mole fraction and 4-aminothiophenol concentration
on morphol. of **silver nanoparticle**)
IT **1193-02-8**, 4-Aminothiophenol
RL: PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process)
(effect of solvent mole fraction and 4-aminothiophenol concentration
on morphol. of **silver nanoparticle**)
IT 7440-22-4P, SIlver, properties
RL: PNU (Preparation, unclassified); PRP (Properties); PREP (Preparation)
(effect of solvent mole fraction and 4-aminothiophenol concentration
on morphol. of **silver nanoparticle**)
IT 75-05-8, Acetonitrile, processes
RL: PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process)
(solvent; effect of solvent mole fraction and 4-aminothiophenol concentration on morphol. of **silver nanoparticle**)

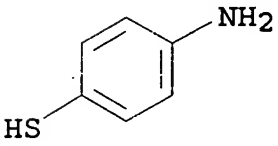
L119 ANSWER 13 OF 36 HCAPLUS COPYRIGHT 2005 ACS on STN
2004:144462 Document No. 140:395889 Controlled interlinking of Au and Ag nanoclusters using 4-aminothiophenol as molecular interconnects. Sharma, Jadab; Chaki, Nirmalya K.; Mandale, A. B.; Pasricha, Renu; Vijayamohanan, K. (Physical Chemistry Division, National Chemical Laboratory, Pune, 411008, India). Journal of Colloid and Interface Science, 272(1), 145-152 (English) 2004. CODEN: JCISA5. ISSN: 0021-9797. Publisher: Elsevier Science.
AB This work describes the formation of interlinked gold and silver nanoclusters at controlled pH using 4-aminothiophenol (ATP) as a

mol. interconnect. **UV**-visible spectra give on intercrystal plasmon resonance band in the region 550-580 nm. The crystalline heteroassembly formation is also evident from the transmission electron microscopic (TEM) images, whereas X-ray photoelectron spectroscopic (XPS) anal. of the aggregates shows the presence of charged -N species, indicating electrostatic interaction of -N with Ag nanoclusters. Furthermore, electrochem. studies of these heteroassembled systems suggest that silver nanoclusters are not fully passivated by the monolayers of ATP and are accessible for redox reactions.

IT **1193-02-8D**, 4-Aminothiophenol, gold bound
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process)
(controlled assembly of **gold** and **silver nanoparticles** using aminothiophenol)

RN 1193-02-8 HCAPLUS

CN Benzenethiol, 4-amino- (9CI) (CA INDEX NAME)



CC 66-6 (Surface Chemistry and Colloids)

ST assembly interlinking **gold silver nanoparticle** aminothiophenol morphol cyclic voltammetry

IT **Nanoparticles**
Self-assembly
(controlled assembly of **gold** and **silver nanoparticles** using aminothiophenol)

IT Cyclic voltammetry
Microstructure
(of **gold** and **silver nanoparticles** assembled by aminothiophenol)

IT 7440-22-4, Silver, properties
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process)
(assembled with **gold nanoparticle**; controlled assembly of **gold** and **silver nanoparticles** using aminothiophenol)

IT 7440-57-5D, Gold, thiolated
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process)

(assembled with **silver nanoparticle**; controlled assembly of **gold** and **silver nanoparticles** using aminothiophenol)

IT **1193-02-8D**, 4-Aminothiophenol, gold bound
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process)
(controlled assembly of **gold** and **silver nanoparticles** using aminothiophenol)

L119 ANSWER 14 OF 36 HCAPLUS COPYRIGHT 2005 ACS on STN
2004:4521 Document No. 141:3650 Immunoassay using probe-labelling immunogold **nanoparticles** with **silver** staining enhancement via surface-enhanced Raman scattering. Xu, Shuping; Ji, Xiaohui; Xu, Weiqing; Li, Xiaoling; Wang, Lianying; Bai, Yubai; Zhao, Bing; Ozaki, Yukihiro (Key Laboratory for Supramolecular Structure and Material of Ministry of Education, Jilin University, Changchun, 130021, Peop. Rep. China). Analyst (Cambridge, United Kingdom), 129(1), 63-68 (English) 2004. CODEN: ANALAO. ISSN: 0003-2654. Publisher: Royal Society of Chemistry.

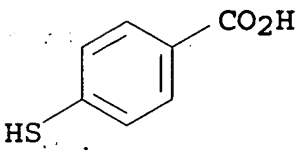
AB This paper reports a novel immunoassay based on surface-enhanced Raman scattering (SERS) and immunogold labeling with silver staining enhancement. Immunoreactions between immunogold colloids modified by a Raman-active probe mol. (e.g., 4-mercaptobenzoic acid) and antigens, which were captured by antibody-assembled chips such as silicon or quartz, were detected via SERS signals of Raman-active probe mol. All the self-assembled steps were subjected to the measurements of **UV**-visible (**UV** -vis) spectra to monitor the formation of a sandwich structure onto a substrate. The immunoassay was performed by a sandwich structure consisting of three layers. The first layer was composed of immobilized antibody mols. of mouse polyclonal antibody against Hepatitis B virus surface antigen (PAb) on a silicon or quartz substrate. The second layer was the complementary Hepatitis B virus surface antigen (Antigen) mols. captured by PAb on the substrate. The third layer was composed of the probe-labeling immunogold **nanoparticles**, which were modified by mouse monoclonal antibody against Hepatitis B virus surface antigen (MAb) and 4-mercaptobenzoic acid (MBA) as the Raman-active probe on the surface of gold colloids. After silver staining enhancement, the antigen is identified by a SERS spectrum of MBA. A working curve of the intensity of a SERS signal at 1585 cm-1 due to the ν8a aromatic ring vibration of MBA vs. the concentration of analyte (Antigen) was obtained and the non-optimized detection limit for the Hepatitis B virus surface antigen was found to be as

low as 0.5 μg mL-1.

IT **1074-36-8**, 4-Mercaptobenzoic acid
RL: BUU (Biological use, unclassified); BIOL (Biological study); USES (Uses)
(immunoassay using probe-labeling immunogold **nanoparticles** with **silver** staining enhancement via surface-enhanced Raman scattering)

RN 1074-36-8 HCAPLUS

CN Benzoic acid, 4-mercapto- (9CI) (CA INDEX NAME)



CC 9-10 (Biochemical Methods)
Section cross-reference(s): 15

ST immunoassay labeling immunogold **nanoparticle** monoclonal antibody antigen

IT Antigens
RL: ANT (Analyte); BSU (Biological study, unclassified); PRP (Properties); ANST (Analytical study); BIOL (Biological study)
(hepatitis B surface; immunoassay using probe-labeling immunogold **nanoparticles** with **silver** staining enhancement via surface-enhanced Raman scattering)

IT Antibodies and Immunoglobulins
RL: BSU (Biological study, unclassified); BIOL (Biological study)
(immobilized; immunoassay using probe-labeling immunogold **nanoparticles** with **silver** staining enhancement via surface-enhanced Raman scattering)

IT Immunoassay
SERS (Raman scattering)
(immunoassay using probe-labeling immunogold **nanoparticles** with **silver** staining enhancement via surface-enhanced Raman scattering)

IT Immunoassay
(immunogold staining; immunoassay using probe-labeling immunogold **nanoparticles** with **silver** staining enhancement via surface-enhanced Raman scattering)

IT **Nanoparticles**
(immunogold; immunoassay using probe-labeling immunogold **nanoparticles** with **silver** staining enhancement via surface-enhanced Raman scattering)

IT Antibodies and Immunoglobulins
RL: BSU (Biological study, unclassified); BIOL (Biological study)
(monoclonal; immunoassay using probe-labeling immunogold **nanoparticles** with **silver** staining enhancement via surface-enhanced Raman scattering)
IT **1074-36-8**, 4-Mercaptobenzoic acid
RL: BUU (Biological use, unclassified); BIOL (Biological study); USES (Uses)
(immunoassay using probe-labeling immunogold **nanoparticles** with **silver** staining enhancement via surface-enhanced Raman scattering)
IT 7440-21-3, Silicon, uses 14808-60-7, Quartz, uses
RL: DEV (Device component use); USES (Uses)
(immunoassay using probe-labeling immunogold **nanoparticles** with **silver** staining enhancement via surface-enhanced Raman scattering)
IT 7440-22-4, Silver, biological studies
RL: BSU (Biological study, unclassified); BIOL (Biological study)
(staining; immunoassay using probe-labeling immunogold **nanoparticles** with **silver** staining enhancement via surface-enhanced Raman scattering)

L119 ANSWER 15 OF 36 HCAPLUS COPYRIGHT 2005 ACS on STN
2003:980937 Document No. 140:263164 Diethynyl-Zn-porphyrin-based assemblies: optical and morphological studies of **nanostructured** thin films. Fratoddi, I.; Battocchio, C.; D'Amato, R.; Di Egidio, G. P.; Ugo, L.; Polzonetti, G.; Russo, M. V. (Department of Chemistry, University "La Sapienza", Rome, 00185, Italy). Materials Science & Engineering, C: Biomimetic and Supramolecular Systems, C23(6-8), 867-871 (English) 2003. CODEN: MSCEEE. ISSN: 0928-4931. Publisher: Elsevier Science B.V..
AB The authors focus their attention on the morphol. and optical characterization of self-assembled Zn-porphyrin-based/fullerene systems. Diethynyl-Zn-porphyrin (ZnDEP) and bimetallic σ-bonded arrays of diethynyl-Zn-porphyrin with Pd(II) and Pt(II) square planar complexes, namely, ZnDEP, Pd-ZnDEP and Pt-ZnDEP, were synthesized, and these compds. were studied in the self-assembly behavior with fullerene, giving rise to the mol. composites ZnDEP/C60, Pd-ZnDEP/C60 and Pt-ZnDEP/C60. Thick films of the materials were deposited by slow evaporation on glass substrates, to be morphol. characterized by SEM technique. The surface anal. showed a peculiar nanometric structure of the composites. The optical (**UV**-visible absorption and **emission**) characterization of toluene solns. and a preliminary study on the O2 luminescence quenching of

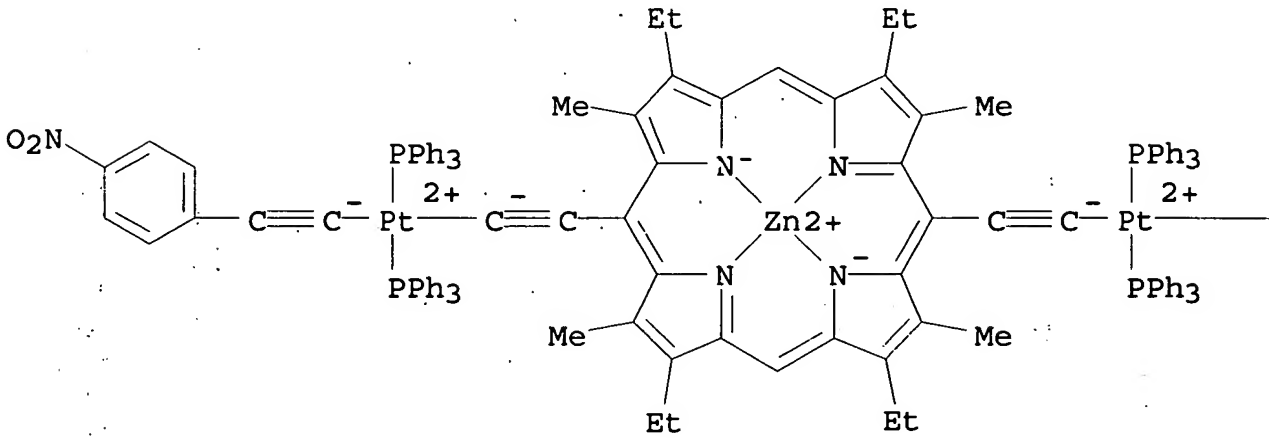
diethynyl-Zn-porphyrin, diethynyl-Zn-porphyrin/fullerene and Pt or Pd-containing homologs were performed and will be here discussed. A luminescence response towards O2 was observed in the case of ZnDEP and ZnDEP/C60 samples with a lowering of the intensity of the **emission**, suggesting promising applications in optical sensors.

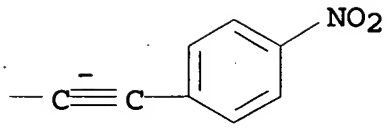
IT **669705-68-4D**, adduct with C60 fullerene
669705-69-5D, adduct with C60 fullerene
RL: ARU (Analytical role, unclassified); DEV (Device component use); PRP (Properties); ANST (Analytical study); USES (Uses)
(diethynyl-Zn-porphyrin-based assemblies and optical and morphol. studies of **nanostructured** thin films)

RN 669705-68-4 HCAPLUS

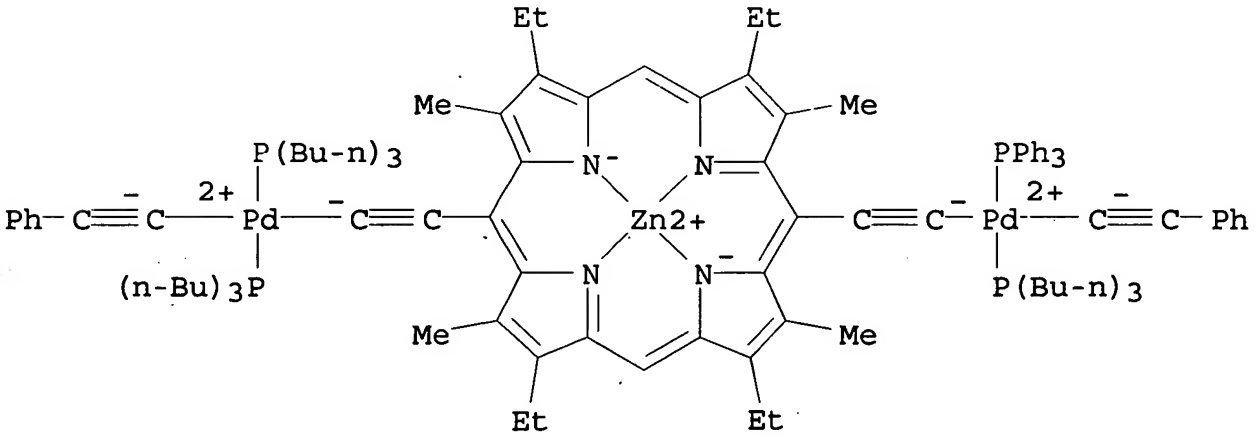
CN Platinum, bis[(4-nitrophenyl)ethynyl][μ3-[2,8,12,18-tetraethyl-5,15-di(ethynyl-κC2)-3,7,13,17-tetramethyl-21H,23H-porphinato(4-)-κN21,κN22,κN23,κN24]]tetrakis(triphenylphosphine)(zinc)di-, stereoisomer (9CI) (CA INDEX NAME)

PAGE 1-A





RN 669705-69-5 HCAPLUS
CN Palladium, bis(phenylethynyl)[μ3-[2,8,12,18-tetraethyl-5,15-di(ethynyl-κC2)-3,7,13,17-tetramethyl-21H,23H-porphinato(4-)-κN21,κN22,κN23,κN24]]tetrakis(triphenylphosphine)(zinc)di-, stereoisomer (9CI) (CA INDEX NAME)



CC 79-3 (Inorganic Analytical Chemistry)
ST diethynyl zinc porphyrin film based assembly optical morphol **nanostructured**
IT Films
Nanostructures
Surface structure
(diethynyl-Zn-porphyrin-based assemblies and optical and morphol. studies of **nanostructured** thin films)
IT Optical sensors
(diethynyl-Zn-porphyrin-based assemblies and optical and morphol. studies of **nanostructured** thin films for

oxygen optical sensors)

IT 140707-97-7D, adduct with C60 fullerene **669705-68-4D**, adduct with C60 fullerene **669705-69-5D**, adduct with C60 fullerene
RL: ARU (Analytical role, unclassified); DEV (Device component use); PRP (Properties); ANST (Analytical study); USES (Uses)
(diethynyl-Zn-porphyrin-based assemblies and optical and morphol. studies of **nanostructured** thin films)

IT 7782-44-7, Oxygen, analysis
RL: ANT (Analyte); ANST (Analytical study)
(diethynyl-Zn-porphyrin-based assemblies and optical and morphol. studies of **nanostructured** thin films for oxygen optical sensors)

IT 99685-96-8D, Fullerene-60, adducts with diethynyl-Zn-porphyrin
RL: ARU (Analytical role, unclassified); DEV (Device component use); PRP (Properties); ANST (Analytical study); USES (Uses)
(diethynyl-Zn-porphyrin-based assemblies and optical and morphol. studies of **nanostructured** thin films for oxygen optical sensors)

L119 ANSWER 16 OF 36 HCAPLUS COPYRIGHT 2005 ACS on STN

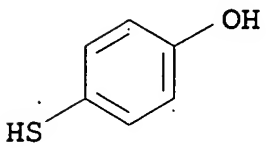
2003:978072 Document No. 140:153653 Ultrafast study of electronic relaxation dynamics in Au11 nanoclusters. Grant, Christian D.; Schwartzberg, Adam M.; Yang, Yiyun; Chen, Shaowei; Zhang, Jin Z. (Department of Chemistry, University of California at Santa Cruz, Santa Cruz, CA, 95064, USA). Chemical Physics Letters, 383(1,2), 31-34 (English) 2004. CODEN: CHPLBC. ISSN: 0009-2614. Publisher: Elsevier Science B.V..

AB Ultrafast electronic relaxation measurements in thiol-capped Au11 reveal an excited state lifetime of >500 ps, similar to Au13 and Au28. Upon extended exposure to **laser light**, a small amplitude, fast relaxation component was observed and attributed to formation of larger particles or aggregates. The long lifetime, combined with a lack of excitation intensity dependence, indicates that Au11 behaves more mol.-like rather than a typical, bulk-like **gold metal nanoparticle**. The main relaxation pathway is proposed to be non-**radiative** mediated by a large number of surface trap states.

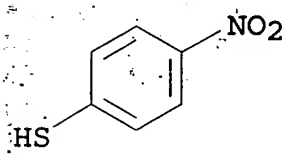
IT **637-89-8**, 4-Hydroxythiophenol **1849-36-1**, 4-Nitrothiophenol
RL: NUU (Other use, unclassified); PRP (Properties); USES (Uses)
(ultrafast study of electronic relaxation dynamics in Au11 nanoclusters capped with)

RN 637-89-8 HCAPLUS

CN Phenol, 4-mercapto- (9CI) (CA INDEX NAME)



RN 1849-36-1 HCAPLUS
CN Benzenethiol, 4-nitro- (9CI) (CA INDEX NAME)



CC 73-4 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
ST electronic relaxation dynamics gold nanocluster **laser radiation**
IT Clusters
(metal; ultrafast study of electronic relaxation dynamics in Au11 nanoclusters upon extended exposure to **laser light**)
IT Optical absorption
Photoexcitation
UV and visible spectra
(ultrafast study of electronic relaxation dynamics in Au11 nanoclusters upon extended exposure to **laser light**)
IT 112-55-0, n-Dodecanethiol **637-89-8**, 4-Hydroxythiophenol **1849-36-1**, 4-Nitrothiophenol 93629-13-1, Benzeneethanethiol, ion(1-)
RL: NUU (Other use, unclassified); PRP (Properties); USES (Uses)
(ultrafast study of electronic relaxation dynamics in Au11 nanoclusters capped with)
IT 145536-87-4, Gold mol. (Au11), properties
RL: PRP (Properties)
(ultrafast study of electronic relaxation dynamics in Au11 nanoclusters upon extended exposure to **laser light**)

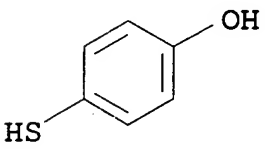
L119 ANSWER 17 OF 36 HCAPLUS COPYRIGHT 2005 ACS on STN
2003:950216 Document No. 140:10452 **Nanoparticle**-based electroluminescent diode. Wei, Fang Su; Ching, Fuh Lin (National Taiwan University, Taiwan). Fr. Demande FR 2840502 A1 20031205, 16 pp. (French). CODEN: FRXXBL. APPLICATION: FR 2002-6753 20020531.

AB This invention makes it possible to obtain a less expensive electroluminescent diode realized by using oxides of unique size, semiconductors or electroluminescent compds. with **nanoparticles** to manufacture better electroluminescent diodes and with narrower bandwidth. This invention uses electroluminescent **nanoparticles** which dissolve in a liquid solution and resorts to procedures of vapor coating, steeping or centrifugation in all forms and all materials to manufacture electroluminescent diodes cheaper, of greater dimension and more effective.

IT **637-89-8**, p-Hydroxythiophenol
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(**nanoparticle**-based LED fabrication using)

RN 637-89-8 HCAPLUS

CN Phenol, 4-mercapto- (9CI) (CA INDEX NAME)



IC ICM H05B033-10
ICS H05B033-12

CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 78

ST LED **nanoparticle**; oxide LED **nanoparticle**; cadmium sulfide LED **nanoparticle**

IT Electroluminescent devices
(blue-**emitting**; **nanoparticle**-based LED)

IT Luminescent substances
(electroluminescent; **nanoparticle**-based LEDs containing)

IT Electroluminescent devices
(green-**emitting**; **nanoparticle**-based LED)

IT **Nanoparticles**

(**nanoparticle**-based LED)
IT Centrifugation
Vapor deposition process
(**nanoparticle**-based LED fabrication using)
IT Electrodes
Semiconductor materials
(**nanoparticle**-based LEDs containing)
IT Oxides (inorganic), uses
RL: DEV (Device component use); USES (Uses)
(**nanoparticle**-based LEDs containing)
IT Electroluminescent devices
(red-**emitting**; **nanoparticle**-based LED)
IT Electroluminescent devices
(thin-film; **nanoparticle**-based LED)
IT 7429-90-5, Aluminum, uses 7439-95-4, Magnesium, uses
7440-22-4, **Silver**, uses 7440-47-3, Chromium, uses
7440-57-5, **Gold**, uses
RL: DEV (Device component use); USES (Uses)
(electrode; **nanoparticle**-based LEDs containing)
IT 543-90-8, Cadmium diacetate **637-89-8**,
p-Hydroxythiophenol 1313-82-2, Disodium monosulfide, processes
2180-18-9, Manganese acetate
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(**nanoparticle**-based LED fabrication using)
IT 1306-23-6, Cadmium monosulfide, uses 7631-86-9, Silica, uses
RL: DEV (Device component use); USES (Uses)
(**nanoparticle**-based LEDs containing)
IT 7440-21-3, Silicon, uses
RL: DEV (Device component use); USES (Uses)
(substrate; **nanoparticle**-based LEDs containing)

L119 ANSWER 18 OF 36 HCAPLUS COPYRIGHT 2005 ACS on STN
2003:791765 Document No. 140:7062 **Light** Energy Conversion Using Mixed Molecular Nanoclusters. Porphyrin and C60 Cluster Films for Efficient **Photocurrent** Generation. Hasobe, Taku; Imahori, Hiroshi; Fukuzumi, Shunichi; Kamat, Prashant V. (Notre Dame Radiation Laboratory, University of Notre Dame, Notre Dame, IN, 46556-0579, USA). Journal of Physical Chemistry B, 107(44), 12105-12112 (English) 2003. CODEN: JPCBFK. ISSN: 1520-6106. Publisher: American Chemical Society.
AB Composite mol. nanoclusters of fullerene and porphyrin prepared in acetonitrile/toluene mixed solvent absorb **light** over the entire spectrum of visible **light**. Upon slow evaporation of the solvent on the copper grid, these mixed nanoclusters undergo

close-packed stacking to produce either tubular- or square-shaped microcrystallites and differ from those obtained from single-component clusters. The highly colored composite clusters can be assembled as 3-dimensional arrays onto **nanostructured** SnO2 films using an electrophoretic deposition approach. The composite cluster films exhibit an incident photon-to-**photocurrent** efficiency (IPCE) ≤17% at an applied potential of 0.2 V vs. SCE, which is significantly higher than the additive effect observed from either porphyrin (IPCE = 1.6%) or fullerene clusters (IPCE = 5.0%) under similar photoelectrochem. conditions. The high IPCE values observed with porphyrin and C60 clusters demonstrate the synergy of these systems toward yielding efficient photoinduced charge separation within these composite nanoclusters.

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 74, 76

ST nanocluster porphyrin C60 cluster film efficiency **photocurrent** photoelec cell

IT Electron transfer
Microcrystallites
Nanostructures
Photocurrent
Photoelectric devices
Photovoltage
(**light** energy conversion using mixed mol. nanoclusters. of bis(**di**-tert-butylphenyl) **porphyrin** and C60 cluster films for efficient **photocurrent** generation in iodide photoelec. cells)

IT Clusters
(nano-; **light** energy conversion using mixed mol. nanoclusters. of bis(**di**-tert-butylphenyl) **porphyrin** and C60 cluster films for efficient **photocurrent** generation in iodide photoelec. cells)

IT Photoelectrochemistry
(of porphyrin/C60 mixed nanocluster films; **light** energy conversion using mixed mol. nanoclusters. of bis(**di**-tert-butylphenyl) **porphyrin** and C60 cluster films for efficient **photocurrent** generation in iodide photoelec. cells)

IT Electron transfer
(photochem., photon-to-current conversion efficiency; **light** energy conversion using mixed mol. nanoclusters. of bis(**di**-tert-butylphenyl) **porphyrin** and C60 cluster films for efficient **photocurrent**

generation in iodide photoelec. cells)
IT Electric current-potential relationship
(**photocurrent**-photovoltage; **light** energy conversion using mixed mol. nanoclusters. of bis(**di**-tert-butylphenyl) **porphyrin** and C60 cluster films for efficient **photocurrent** generation in iodide photoelec. cells)
IT 7553-56-2, Iodine, uses 7681-82-5, Sodium iodide, uses
RL: DEV (Device component use); USES (Uses)
(electrolyte; **light** energy conversion using mixed mol. nanoclusters. of bis(**di**-tert-butylphenyl) **porphyrin** and C60 cluster films for efficient **photocurrent** generation in iodide photoelec. cells)
IT 7440-50-8, Copper, uses
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(grid; **light** energy conversion using mixed mol. nanoclusters. of bis(**di**-tert-butylphenyl) **porphyrin** and C60 cluster films for efficient **photocurrent** generation in iodide photoelec. cells)
IT 7440-06-4, Platinum, uses
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(**light** energy conversion using mixed mol. nanoclusters. of bis(**di**-tert-butylphenyl) **porphyrin** and C60 cluster films for efficient **photocurrent** generation in iodide photoelec. cells)
IT 18282-10-5, Tin oxide (SnO2)
RL: PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process)
(**nanostructured**, coated with porphyrin-C60 films; **light** energy conversion using mixed mol. nanoclusters. of bis(**di**-tert-butylphenyl) **porphyrin** and C60 cluster films for efficient **photocurrent** generation in iodide photoelec. cells)
IT 173613-63-3P
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); SPN (Synthetic preparation); PREP (Preparation); PROC (Process)
(plain or co-deposited composite films with fullerene-60; **light** energy conversion using mixed mol. nanoclusters. of bis(**di**-tert-butylphenyl) **porphyrin** and C60 cluster films for efficient **photocurrent** generation in iodide photoelec. cells)
IT 99685-96-8P, Fullerene-60

RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); SPN (Synthetic preparation); PREP (Preparation); PROC (Process)
(plain or co-deposited composite films with porphyrin; **light** energy conversion using mixed mol. nanoclusters. of bis(**di**-tert-butylphenyl) **porphyrin** and C60 cluster films for efficient **photocurrent** generation in iodide photoelec. cells)

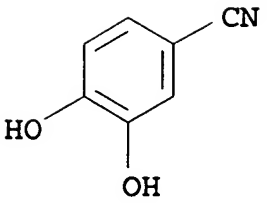
L119 ANSWER 19 OF 36 HCAPLUS COPYRIGHT 2005 ACS on STN
2003:434215 Document No. 138:409312 Thermographic recording material with improved developability. Geuens, Ingrid; Verberkt, Luc; Hoogmartens, Ivan; De Voeght, Frank; Vanwelkenhuysen, Iris (Agfa-Gevaert, Belg.). Eur. Pat. Appl. EP 1316845 A1 20030604, 26 pp. DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, SK. (English). CODEN: EPXXDW. APPLICATION: EP 2002-102623 20021122. PRIORITY: EP 2001-691 20011130.

AB A black and white thermog. recording material comprises a thermosensitive element and a support, the thermosensitive element containing at least one substantially **light**-insensitive organic silver salt, a binder and optionally **photosensitive** silver halide, characterized in that the thermosensitive element further contains deliberately added **metal nano -particles** in a molar ratio with respect to the total molar concentration of the at least one substantially **light** -insensitive organic silver salt in the range of 0.05:1 to 10-6:1; and the use for the purpose of increasing the ratio of Dmax to the quantity of said substantially **light**-insensitive organic silver salts per unit area of the above-mentioned thermog. recording material.

IT **17345-61-8**, 3,4-Dihydroxybenzonitrile
RL: TEM (Technical or engineered material use); USES (Uses)
(thermog. recording material with improved developability containing)

RN 17345-61-8 HCAPLUS

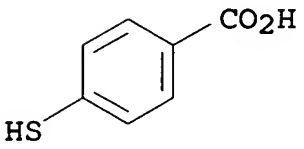
CN Benzonitrile, 3,4-dihydroxy- (9CI) (CA INDEX NAME)



IC ICM G03C001-498
ICS B41M005-30
CC 74-2 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
IT 121-79-9, n-Propyl gallate 3943-89-3, Ethyl 3,4-dihydroxybenzoate **17345-61-8**, 3,4-Dihydroxybenzonitrile 45936-43-4
RL: TEM (Technical or engineered material use); USES (Uses)
(thermog. recording material with improved developability containing)

L119 ANSWER 20 OF 36 HCAPLUS COPYRIGHT 2005 ACS on STN
2003:399522 Document No. 138:383713 Immunological identification with SERS-labeled immunogold **nanoparticles** by **silver** staining. Xu, Shu-Ping; Wang, Lian-Ying; Xu, Wei-Qing; Zhao, Bing; Yuan, Hang; Ma, Lan; Bai, Yu-Bai; Fan, Yu-Guo (Key Laboratory for Supramolecular Structure and Material of Ministry of Education of China, Peop. Rep. China). Gaodeng Xuexiao Huaxue Xuebao, 24(5), 900-902 (Chinese) 2003. CODEN: KTHPDM. ISSN: 0251-0790. Publisher: Gaodeng Jiaoyu Chubanshe.
AB A spectral measurement combined with **nanoparticle** labeling and SERS technique is described. The **gold nanoparticles** not only modified by the mouse monoclonal antibody against Hepatitis B surface antigen [IgG(H)] but also labeled by the p-mercaptobenzoic acid (MBA) were used as a probe. The immunogold **nanoparticles** specially react with the antibody against IgG(H) [anti IgG (H)] which was immobilized on the quartz substrates. The identification between the immunogold colloids and the anti IgG(H) was examined by surface enhanced Raman spectra (SERS) of MBA after and before silver staining and confirmed by **UV**-Vis absorption spectra.
IT **1074-36-8**, p-Mercaptobenzoic acid
RL: ARU (Analytical role, unclassified); ANST (Analytical study)
(immunol. identification with surface enhanced Raman spectra-labeled immunogold **nanoparticles** by **silver** staining)

RN 1074-36-8 HCAPLUS
CN Benzoic acid, 4-mercapto- (9CI) (CA INDEX NAME)



CC 15-1 (Immunochemistry)
Section cross-reference(s): 66, 73
ST SERS immunogold **nanoparticle silver** staining antibody
IT Antibodies and Immunoglobulins
RL: ANT (Analyte); ARG (Analytical reagent use); ANST (Analytical study); USES (Uses)
(IgG, monoclonal; immunol. identification with surface enhanced Raman spectra-labeled immunogold **nanoparticles** by **silver** staining)
IT Antigens
RL: BSU (Biological study, unclassified); BIOL (Biological study)
(hepatitis B surface; immunol. identification with surface enhanced Raman spectra-labeled immunogold **nanoparticles** by **silver** staining)
IT Immunoassay
Nanoparticles
SERS (Raman scattering)
Staining, biological
(immunol. identification with surface enhanced Raman spectra-labeled immunogold **nanoparticles** by **silver** staining)
IT **1074-36-8**, p-Mercaptobenzoic acid 7440-22-4, Silver, analysis 7440-57-5, Gold, analysis
RL: ARU (Analytical role, unclassified); ANST (Analytical study)
(immunol. identification with surface enhanced Raman spectra-labeled immunogold **nanoparticles** by **silver** staining)

L119 ANSWER 21 OF 36 HCAPLUS COPYRIGHT 2005 ACS on STN
2003:295840 Document No. 139:203137 Micropatterns constructed from **Au nanoparticles.** Lu, Conghua; Wu, Nianzu; Jiao, Xiaoming; Luo, Chuanqiou; Cao, Weixiao (College of Chemistry and Molecular Engineering, Peking University, Beijing, 100871, Peop. Rep. China). Chemical Communications (Cambridge, United

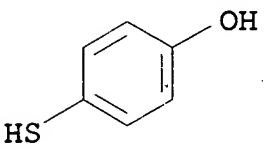
Kingdom) (9), 1056-1057 (English) 2003. CODEN: CHCOFS. ISSN: 1359-7345. Publisher: Royal Society of Chemistry.

AB Covalently linked Au-NPs micropatterns were successfully fabricated from the self-assembly film composed of 4-mercaptophenol-capped **Au nanoparticles** (**Au**-NPs) and -N2+ containing polymers of nitro-diazoresin (NDR) by selective exposure to **UV light** and development in Na dodecyl sulfate (SDS) aqueous solution The resultant well-defined micropatterns were characterized with AFM and XPS.

IT **637-89-8**, 4-Mercaptophenol
RL: CPS (Chemical process); NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(micropatterns constructed from **gold nanoparticles** using self assembly with nitro diazonium resin)

RN 637-89-8 HCAPLUS

CN Phenol, 4-mercapto- (9CI) (CA INDEX NAME)



CC 66-4 (Surface Chemistry and Colloids)
Section cross-reference(s): 35, 74, 76

ST **photolithog gold nanoparticle** nitro diazonium resin silicon self assembly

IT **Photolysis**
(**UV**; micropatterns constructed from **gold nanoparticles** using self assembly with nitro diazonium resin)

IT Hydrogen bond
Nanoparticles
Self-assembly
UV and visible spectra
X-ray photoelectron spectra
(micropatterns constructed from **gold nanoparticles** using self assembly with nitro diazonium resin)

IT **637-89-8**, 4-Mercaptophenol 245511-08-4
RL: CPS (Chemical process); NUU (Other use, unclassified); PEP

(Physical, engineering or chemical process); PROC (Process); USES (Uses)
(micropatterns constructed from **gold** **nanoparticles** using self assembly with nitro diazonium resin)

IT 7440-57-5, Gold, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(micropatterns constructed from **gold** **nanoparticles** using self assembly with nitro diazonium resin)

IT 151-21-3, Sodium dodecylsulfate, processes
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(micropatterns constructed from **gold** **nanoparticles** using self assembly with nitro diazonium resin)

IT 245511-08-4DP, 4-mercaptophenol-capped
RL: PRP (Properties); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(micropatterns constructed from **gold** **nanoparticles** using self assembly with nitro diazonium resin)

IT 7440-21-3, Silicon, processes
RL: PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(substrate; micropatterns constructed from **gold** **nanoparticles** using self assembly with nitro diazonium resin)

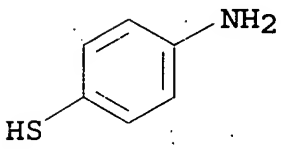
L119 ANSWER 22 OF 36 HCAPLUS COPYRIGHT 2005 ACS on STN
2003:16550 Document No. 138:310912 Controlling the surface enhanced Raman effect via the nanoshell geometry. Jackson, J. B.; Westcott, S. L.; Hirsch, L. R.; West, J. L.; Halas, N. J. (Department of Physics and Astronomy, Rice University, Houston, TX, 77005, USA). Applied Physics Letters, 82(2), 257-259 (English) 2003. CODEN: APPLAB. ISSN: 0003-6951. Publisher: American Institute of Physics.

AB Systematic variation of the internal geometry of a dielec. core-**metal** shell **nanoparticle** allows the local electromagnetic field at the **nanoparticle** surface to be precisely controlled. The strength of the field as a function of

core and shell dimension is measured by monitoring the surface enhanced Raman scattering (SERS) response of nonresonant mol. adsorbates (para-mercaptoaniline) bound to the **nanoparticle** surface. The SERS enhancement appears to be directly and exclusively due to **nanoparticle** geometry. Effective SERS enhancements of 106 are observable in aqueous solution, which correspond to absolute enhancements of 1012 when reabsorption of Raman **emission** by nearby **nanoparticles** is taken into account.

IT **1193-02-8**, p-Mercaptoaniline
RL: PRP (Properties)
(adsorbate; controlling SERS effect via the nanoshell geometry)

RN 1193-02-8 HCAPLUS
CN Benzenethiol, 4-amino- (9CI) (CA INDEX NAME)



CC 73-3 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 66

ST mercaptoaniline SERS surface **silver** shell silica **nanoparticle** geometry; electromagnetic field surface **silver** shell silica **nanoparticle** geometry SERS

IT **Nanoparticles**
SERS (Raman scattering)
(controlling the surface enhanced Raman effect via the nanoshell geometry)

IT **1193-02-8**, p-Mercaptoaniline
RL: PRP (Properties)
(adsorbate; controlling SERS effect via the nanoshell geometry)

IT 7440-22-4, **Silver**, properties 7631-86-9, Silica, properties
RL: PRP (Properties)
(silica **nanoparticle** core-**silver** shell; controlling SERS effect via the nanoshell geometry)

L119 ANSWER 23 OF 36 HCAPLUS COPYRIGHT 2005 ACS on STN
2002:876107 Document No. 138:177222 Photoelectrochemical behavior of p-ATP/PANI film and **nanoparticulate** p-ATP/PANI/TiO2 film on Au electrodes. Luo, Jin; Huang, Huaiguo; Lin, Zhonghua; Hepel,

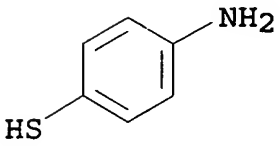
Maria (Department of Chemistry, State University of New York at Potsdam, Potsdam, NY, 13676, USA). ACS Symposium Series, 832(Conducting Polymers and Polymer Electrolytes), 113-127 (English) 2003. CODEN: ACSMC8. ISSN: 0097-6156. Publisher: American Chemical Society.

AB New multi-layer film electrodes for solar energy conversion applications, PANI (polyaniline) films on Au/p-ATP (p-aminothiophenol) substrates, and **nano-particulate Au**/p-ATP/PANI/TiO2 films were prepared by electrochem. methods. The behavior and properties of Au/p-ATP, Au/p-ATP/PANI and Au/p-ATP/PANI/TiO2 films were studied by **photocurrent** spectroscopy and electrochem. quartz crystal nanobalance (EQCN) technique. Both cathodic and anodic **photocurrents**, generated in Au/p-ATP/PANI and Au/p-ATP/PANI/TiO2 films upon illumination in different potential regions, were observed. The **photocurrent** spectra for Au/p-ATP/PANI film electrodes show a sub-bandgap excitation and follow the Fowler's rule. A model based on internal photoemission at semiconductor covered metal is proposed to describe the observed phenomena. The **photocurrent** spectra of **nano-particulate Au**/p-ATP/PANI/TiO2 films show photoelectrochem. characteristics of both TiO2 and PANI films. The wavelength region of the **photocurrent** generation in Au/p-ATP/PANI/TiO2 films covers violet and red **light** regions.

IT **1193-02-8**, p-Aminothiophenol
RL: CPS (Chemical process); DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)
(photoelectrochem. behavior of p-aminothiophenol/polyaniline film and **nanoparticulate** p-aminothiophenol/polyaniline/TiO2 film on Au electrodes)

RN 1193-02-8 HCAPLUS

CN Benzenethiol, 4-amino- (9CI) (CA INDEX NAME)



CC 72-2 (Electrochemistry)
Section cross-reference(s): 35, 52, 76

ST photoelectrochem behavior aminothiophenol adsorbed gold

polyaniline film titania **nanoparticulate**; electrode photoelectrochem aminothiophenol adsorbed gold polyaniline film titania

IT **Photocurrent**
(of p-aminothiophenol/polyaniline film and **nanoparticulate** p-aminothiophenol/polyaniline/TiO2 film on Au electrodes)

IT Band gap
(of polyaniline films and photoelectrochem. behavior of p-aminothiophenol/polyaniline film and **nanoparticulate** p-aminothiophenol/polyaniline/TiO2 film on Au electrodes)

IT Electrodeposition
(of titania on polyaniline film p-aminothiophenol adsorbed on gold and photoelectrochem. behavior of p-aminothiophenol/polyaniline film and **nanoparticulate** p-aminothiophenol/polyaniline/TiO2 film on Au electrodes)

IT Adsorbed substances
(p-aminothiophenol on gold; photoelectrochem. behavior of p-aminothiophenol/polyaniline film and **nanoparticulate** p-aminothiophenol/polyaniline/TiO2 film on Au electrodes)

IT Photoelectrodes
(p-aminothiophenol/polyaniline film and **nanoparticulate** p-aminothiophenol/polyaniline/TiO2 film on Au electrodes)

IT **Nanoparticles**
(photoelectrochem. behavior of p-aminothiophenol/polyaniline film and **nanoparticulate** p-aminothiophenol/polyaniline/TiO2 film on Au electrodes)

IT Polyanilines
RL: CPS (Chemical process); DEV (Device component use); PEP (Physical, engineering or chemical process); PNU (Preparation, unclassified); PRP (Properties); PREP (Preparation); PROC (Process); USES (Uses)
(photoelectrochem. behavior of p-aminothiophenol/polyaniline film and **nanoparticulate** p-aminothiophenol/polyaniline/TiO2 film on Au electrodes)

IT 62-53-3, Aniline, properties
RL: PRP (Properties); RCT (Reactant); RACT (Reactant or reagent)
(electrochem. polymerization on p-aminothiophenol adsorbed on gold in HClO4 solution; photoelectrochem. behavior of p-aminothiophenol-ATP/polyaniline film and **nanoparticulate** p-aminothiophenol/polyaniline/TiO2 film on Au electrodes)

IT 13746-66-2, Potassium ferricyanide 13943-58-3, Potassium ferrocyanide
RL: PRP (Properties); RCT (Reactant); RACT (Reactant or reagent)

(**photocurrent** of p-aminothiophenol/polyaniline/TiO2 film on Au electrodes in solution containing)

IT 13463-67-7P, Titania, uses 25233-30-1P, Polyaniline
RL: CPS (Chemical process); DEV (Device component use); PEP (Physical, engineering or chemical process); PNU (Preparation, unclassified); PRP (Properties); PREP (Preparation); PROC (Process); USES (Uses)
(photoelectrochem. behavior of p-aminothiophenol/polyaniline film and **nanoparticulate** p-aminothiophenol/polyaniline/TiO2 film on Au electrodes)

IT **1193-02-8**, p-Aminothiophenol 7440-57-5, Gold, uses
RL: CPS (Chemical process); DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)
(photoelectrochem. behavior of p-aminothiophenol/polyaniline film and **nanoparticulate** p-aminothiophenol/polyaniline/TiO2 film on Au electrodes)

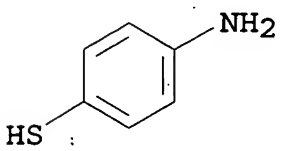
L119 ANSWER 24 OF 36 HCAPLUS COPYRIGHT 2005 ACS on STN
2002:808608 Document No. 138:45218 [60]Fullerene-linked **gold nanoparticles**: synthesis and layer-by-layer growth on a solid surface. Shon, Young-Seok; Choo, Hosun (Department of Chemistry, Western Kentucky University, Bowling Green, KY, 42101, USA). Chemical Communications (Cambridge, United Kingdom) (21), 2560-2561 (English) 2002. CODEN: CHCOFS. ISSN: 1359-7345. Publisher: Royal Society of Chemistry.

AB The facile synthesis of soluble and isolable [60]fullerene-linked **gold nanoparticles** and layer-by-layer assembly of C60/**nanoparticle** films on the solid surface were studied.

IT **1193-02-8**, 4-Aminothiophenol
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(capping layer; synthesis and layer-by-layer growth of fullerene-linked **gold nanoparticles** on solid surface)

RN 1193-02-8 HCAPLUS

CN Benzenethiol, 4-amino- (9CI) (CA INDEX NAME)



CC 66-3 (Surface Chemistry and Colloids)
Section cross-reference(s): 73
ST fullerene **gold nanoparticle** aminothiophenol self assembly
IT Amination
Multilayers
Nanoparticles
Self-assembly
Surface plasmon
Surface reaction
UV and visible spectra
(synthesis and layer-by-layer growth of fullerene-linked **gold nanoparticles** on solid surface)
IT 111-31-9, 1-Hexanethiol **1193-02-8**, 4-Aminothiophenol
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(capping layer; synthesis and layer-by-layer growth of fullerene-linked **gold nanoparticles** on solid surface)
IT 16940-66-2, Sodium tetrahydroborate
RL: RCT (Reactant); RACT (Reactant or reagent)
(reduction agent; synthesis and layer-by-layer growth of fullerene-linked **gold nanoparticles** on solid surface)
IT 99685-96-8, Fullerene C60
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(synthesis and layer-by-layer growth of fullerene-linked **gold nanoparticles** on solid surface)
IT 7440-57-5P, Gold, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PNU (Preparation, unclassified); PREP (Preparation); PROC (Process)
(synthesis and layer-by-layer growth of fullerene-linked **gold nanoparticles** on solid surface)
IT 14337-12-3, Tetrachloroaurate 1-
RL: RCT (Reactant); RACT (Reactant or reagent)
(synthesis and layer-by-layer growth of fullerene-linked **gold nanoparticles** on solid surface)

L119 ANSWER 25 OF 36 HCAPLUS COPYRIGHT 2005 ACS on STN
2002:565654 Document No. 137:270035 CdS-**nanoparticle** **light-emitting** diode on Si. Lin, Ching-Fuh; Liang, Eih-Zhe; Shih, Sheng-Ming; Su, Wei-Fang (Institute of

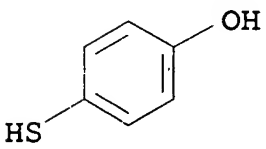
Electro-Optical Engineering, National Taiwan University, Taipei, Taiwan). Proceedings of SPIE-The International Society for Optical Engineering, 4641(Light-Emitting Diodes: Research, Manufacturing, and Applications VI), 102-110 (English) 2002. CODEN: PSISDG. ISSN: 0277-786X. Publisher: SPIE-The International Society for Optical Engineering.

AB The fabrication of CdS-**nanoparticle light emitting** diodes (LEDs) on Si and their properties at room temperature and variant temps. are reported. Due to passivation of p-hydroxyl thiophenol group around **nanoparticles**, 86-meV spectral shift of free exciton transition at room temperature is observed Controlled conditions for the preparation of CdS-**nanoparticle** LED such as heat treatment and/or with O-rich environment have significant influences on **emission** spectra. **Radiative** recombination of carriers trapped in O-impurity level of 273 meV presents in samples prepared in O-rich environment. Coalescence of **nanoparticles** into bulk form also occurs to contribute to increased magnitude of luminescence. Spectral behaviors of electroluminescence with varied temperature were studied.

IT **637-89-8**, p-Hydroxythiophenol
RL: PRP (Properties)
(cadmium sulfide deposition in presence of; CdS-**nanoparticle light-emitting** diode on Si)

RN 637-89-8 HCAPLUS

CN Phenol, 4-mercapto- (9CI) (CA INDEX NAME)



CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

ST cadmium sulfide **nanoparticle light emitting** diode silicon

IT Electric current-potential relationship
Electroluminescent devices
Heat treatment
Luminescence, electroluminescence
Radiative recombination
Trapping

(CdS-**nanoparticle light-emitting** diode on Si)

IT Trapping
(surface; CdS-**nanoparticle light-emitting** diode on Si)

IT 7440-21-3, Silicon, uses 7440-47-3, Chromium, uses 7440-57-5, **Gold**, uses 7631-86-9, Silica, uses
RL: DEV (Device component use); USES (Uses)
(CdS-**nanoparticle light-emitting** diode on Si)

IT 7439-96-5, Manganese, uses
RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)
(CdS-**nanoparticle light-emitting** diode on Si)

IT 1306-23-6, Cadmium sulfide, properties
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(CdS-**nanoparticle light-emitting** diode on Si)

IT 78-10-4, Tetraethoxysilane 4420-74-0, (γ-Mercaptopropyl)trimethoxysilane 5743-04-4, Cadmium acetate dihydrate 27610-45-3, Sodium sulfide hydrate
RL: RCT (Reactant); RACT (Reactant or reagent)
(CdS-**nanoparticle light-emitting** diode on Si)

IT **637-89-8**, p-Hydroxythiophenol
RL: PRP (Properties)
(cadmium sulfide deposition in presence of; CdS-**nanoparticle light-emitting** diode on Si)

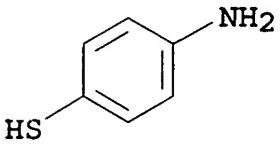
L119 ANSWER 26 OF 36 HCAPLUS COPYRIGHT 2005 ACS on STN
2002:513649 Document No. 137:254585 Preparation and characterization of preferentially grown CdS **nanoparticle** film. Huang, Huai-guo; Xi, Yan-yan; Zheng, Zhi-xin; Yan, Jia-wei; Zhou, Jian-zhang; Wu, Ling-ling; Lin, Zhong-hua (Xiamen Zijin Science and Technology Co., Ltd., Xiamen, 361000, Peop. Rep. China). Dianhuaxue, 8(2), 195-201 (Chinese) 2002. CODEN: DIANFX. ISSN: 1006-3471. Publisher: Dianhuaxue Bianjibu.

AB CdS **nanoparticle** films were prepared on the PANI film, PATP film, Au film and ITO, resp., by constant current deposition or current impulse method, and their structure and characteristics were also studied. The results show that the substrates influence the structure and characteristics of CdS particle film.

IT **1193-02-8**, p-Aminothiophenol

RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process); USES (Uses)
(electrodeposition and characterization of preferentially grown CdS **nanoparticle** film on **gold** and on polyaniline film and on aminothiophenol film and on ITO)

RN 1193-02-8 HCAPLUS
CN Benzenethiol, 4-amino- (9CI) (CA INDEX NAME)



CC 72-2 (Electrochemistry)
Section cross-reference(s): 73, 75, 76
ST cadmium sulfide **nanoparticle** film electrochem prepn characterization; electrodeposition cadmium sulfide **nanoparticle** film substrate effect
IT Fluorescence
X-ray diffraction
(by CdS **nanoparticle** electrodeposited film)
IT **Nanoparticles**
(electrodeposition and characterization of preferentially grown CdS **nanoparticle** film on **gold** and on polyaniline film and on aminothiophenol film and on ITO)
IT Polyanilines
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process); USES (Uses)
(electrodeposition and characterization of preferentially grown CdS **nanoparticle** film on **gold** and on polyaniline film and on aminothiophenol film and on ITO)
IT **Photocurrent**
Surface structure
UV and visible spectra
(of CdS **nanoparticle** electrodeposited film)
IT Electrodeposition
(of CdS **nanoparticle** film from DMSO containing CdCl2 and S)
IT Electrodeposition
(pulse; of CdS **nanoparticle** film from DMSO containing CdCl2 and S)

IT Electric current
(pulsed; in CdS **nanoparticle** film electrodeposition from DMSO containing CdCl2 and S)
IT 1306-23-6, Cadmium sulfide, properties
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(electrodeposition and characterization of preferentially grown CdS **nanoparticle** film on **gold** and on polyaniline film and on aminothiophenol film and on ITO)
IT **1193-02-8**, p-Aminothiophenol 7440-57-5, Gold, uses 25233-30-1, Polyaniline 50926-11-9, Indium tin oxide
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process); USES (Uses)
(electrodeposition and characterization of preferentially grown CdS **nanoparticle** film on **gold** and on polyaniline film and on aminothiophenol film and on ITO)
IT 7704-34-9, Sulfur, reactions 10108-64-2, Cadmium chloride (CdCl2)
RL: RCT (Reactant); RACT (Reactant or reagent)
(electrodeposition using d.c. and pulsed current of CdS **nanoparticle** film from DMSO containing CdCl2 and S)

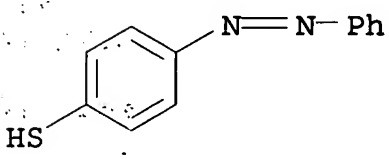
L119 ANSWER 27 OF 36 HCAPLUS COPYRIGHT 2005 ACS on STN
2002:432971 Document No. 137:223986 New dyes for solar cells based on **nanostructured** semiconducting **metal** oxides Synthesis and characterization of ruthenium(II) complexes with thiol-substituted ligands. Ohlsson, Judit; Wolpher, Henriette; Hagfeldt, Anders; Grennberg, Helena (Department of Organic Chemistry, Uppsala University, Uppsala, SE-751 21, Swed.). Journal of Photochemistry and Photobiology, A: Chemistry, 148(1-3), 41-48 (English) 2002. CODEN: JPPCEJ. ISSN: 1010-6030. Publisher: Elsevier Science B.V..
AB Five azo-dyes: 4-phenylazo-phenol, 4-phenylazo-benzeneamine, 4-phenylazo-benzenethiol, 4-phenylazo-benzoic acid, and 4-phenylazo-pyridine have been prepared and used as a "test kit" for rapid screening of functional group affinity to metal oxides. The dyes with carboxylic acid and thiol gave colored electrodes both for ZnO and TiO2 whereas the pyridine had affinity only for TiO2. Also, cis-ruthenium-bis[2,2'-bipyridine]-bis[4-thiopyridine], cis-ruthenium-bis[2,2'-bipyridine]-bis[4-pyridinethiolate], cis-ruthenium-bis[2,2'-bipyridine]-bis[4-carboxypyridine], and cis-ruthenium-bis[2,2'-bipyridine]-[4,4'-dicarboxy-2,2'-bipyridine] have been prepared and adsorbed onto ZnO. In this preliminary photoelectrochem. study, all these

ruthenium-bipyridine dyes show electron injection.

IT **457637-69-3P**
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); SPN (Synthetic preparation); PREP (Preparation); PROC (Process)
(azo dyes as tool for rapid screening of functional group affinity to metal oxides)

RN 457637-69-3 HCAPLUS

CN Benzenethiol, 4-(phenylazo)- (9CI) (CA INDEX NAME)



CC 74-1 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
Section cross-reference(s): 72

ST photoelectrochem solar cell thiol substituted ligand ruthenium complex; zinc titanium oxide electrode thiol substituted ligand ruthenium complex; azo dye sensitized **nanostructured** titania zirconium oxide electrode cell

IT **UV** and visible spectra
(absorption; synthesis and characterization of ruthenium(II) complexes with thiol-substituted ligands and their adsorption on zinc oxide electrodes)

IT Adsorption
Photocurrent
(synthesis and characterization of ruthenium(II) complexes with thiol-substituted ligands and their adsorption on zinc oxide electrodes)

IT 60-09-3P 1562-93-2P, 4-Phenylazo-benzoic acid 1689-82-3P, 4-Phenylazo-phenol 2569-58-6P, 4-Phenylazo-pyridine
457637-69-3P
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); SPN (Synthetic preparation); PREP (Preparation); PROC (Process)
(azo dyes as tool for rapid screening of functional group affinity to metal oxides)

L119 ANSWER 28 OF 36 HCAPLUS COPYRIGHT 2005 ACS on STN
2002:318118 Document No. 137:130326 Thiosalicylic Acid-Functionalized **Silver Nanoparticles**

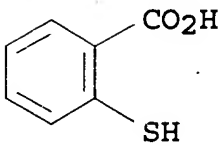
Synthesized in One-Phase System. Tan, Yiwei; Wang, You; Jiang, Lei; Zhu, Daoben (Laboratory of Organic Solids, Chinese Academy of Sciences, Beijing, 100080, Peop. Rep. China). Journal of Colloid and Interface Science, 249(2), 336-345 (English) 2002. CODEN: JCISA5. ISSN: 0021-9797. Publisher: Elsevier Science.

AB A series of silver colloidal dispersions were prepared by two protocols, i.e., addition of the reductant-NaBH4 and the stabilizer-thiosalicylic acid (TSA) into Ag+ solution simultaneously or successively. The products were compared and characterized by TEM, electrochem. measurements, XPS, **UV**-vis, and FT-IR spectra. The size distributions of the **Ag nanoparticles** prepared by the former and latter protocols are bimodal and monodisperse, resp. The analytic results of **UV**-vis spectra coincide with the TEM observation. A tentative explanation was given to the relationship between particle sizes and different synthetic protocols. The changes of the reduction potential of the reductant invoked a variance in particle diameter and size distribution. Electrochem. measurements corroborated our assumption. The composition information of TSA-derived **silver nanoparticles** was obtained from XPS and FT-IR spectroscopic measurements.

IT **147-93-3**, Thiosalicylic acid
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(thiosalicylic acid-functionalized **silver nanoparticles** synthesized in one-phase system)

RN 147-93-3 HCAPLUS

CN Benzoic acid, 2-mercapto- (9CI) (CA INDEX NAME)



CC 66-4 (Surface Chemistry and Colloids)

ST **silver nanoparticle** prepn thiosalicylic acid stabilization particle size

IT Chemisorption
Crystal nucleation
Decomposition
Hydrogen bond
Nanoparticles
Particle size distribution

Reaction kinetics
Reduction
Reduction potential
Sols
(thiosalicylic acid-functionalized **silver** **nanoparticles** synthesized in one-phase system)

IT **147-93-3**, Thiosalicylic acid
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(thiosalicylic acid-functionalized **silver** **nanoparticles** synthesized in one-phase system)

IT 7440-22-4P, Silver, properties
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PNU (Preparation, unclassified); PRP (Properties); PREP (Preparation); PROC (Process)
(thiosalicylic acid-functionalized **silver** **nanoparticles** synthesized in one-phase system)

IT 7761-88-8, Silver nitrate, reactions 16940-66-2, Sodium tetrahydroborate
RL: RCT (Reactant); RACT (Reactant or reagent)
(thiosalicylic acid-functionalized **silver** **nanoparticles** synthesized in one-phase system)

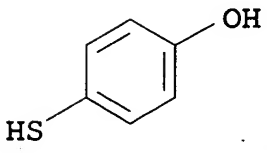
L119 ANSWER 29 OF 36 HCAPLUS COPYRIGHT 2005 ACS on STN
2001:417395 Document No. 135:173613 Development of processing technology for semiconductor **nanoparticled** formed in reverse micellar systems and preparation of **photo**-functional materials. Hirai, Takayuki; Komasawa, Isao (Department of Chemical Science and Engineering, Graduate School of Engineering, Osaka University, Toyonaka, 560-8531, Japan). Kagaku Kogaku Ronbunshu, 27(3), 291-302 (Japanese) 2001. CODEN: KKRBAW. ISSN: 0386-216X. Publisher: Kagaku Kogakkai.

AB Preparation and processing of semiconductor **nanoparticles** by using reverse micellar systems were investigated. Size-controlled **nanoparticles** of **metal** sulfides such as CdS, ZnS and their composites, and metal oxides such as TiO2 were successfully prepared, and the formation mechanisms are discussed. The immobilization of these **nanoparticles** on polymer or silica supports through several new techniques including surface modification and in situ polymerization was investigated. The properties of the resulting semiconductor **nanoparticles**-polymer and -silica composites as **photo** functional materials such as **photocatalysts** were elucidated.

IT **637-89-8**, 4-Hydroxythiophenol

RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(development of processing technol. for semiconductor **nanoparticled** formed in reverse micellar systems)

RN 637-89-8 HCAPLUS
CN Phenol, 4-mercapto- (9CI) (CA INDEX NAME)



CC 76-14 (Electric Phenomena)
Section cross-reference(s): 73, 74
ST semiconductor **nanoparticle** reverse micelle
IT Absorption spectra
Nanoparticles
Particle size
Semiconductor materials
(development of processing technol. for semiconductor **nanoparticled** formed in reverse micellar systems)
IT Polyureas
Polyurethanes, processes
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(development of processing technol. for semiconductor **nanoparticled** formed in reverse micellar systems)
IT Catalysts
(photochem.; development of processing technol. for semiconductor **nanoparticled** formed in reverse micellar systems)
IT Micelles
(reverse; development of processing technol. for semiconductor **nanoparticled** formed in reverse micellar systems)
IT Mica-group minerals, processes
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(thio-modified; development of processing technol. for semiconductor **nanoparticled** formed in reverse micellar systems)
IT 13463-67-7, Titanium dioxide, uses
RL: CAT (Catalyst use); USES (Uses)
(development of processing technol. for semiconductor

nanoparticled formed in reverse micellar systems)

IT 1333-74-0, Hydrogen, formation (nonpreparative)
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)
(development of processing technol. for semiconductor **nanoparticled** formed in reverse micellar systems)

IT 60-24-2, Mercaptoethanol **637-89-8**, 4-Hydroxythiophenol 7631-86-9, Silica, processes 9045-02-7, Ethylene glycol-tolylene-2,4-diisocyanate copolymer,sru 24969-33-3, Ethylene glycol-tolylene-2,4-diisocyanate copolymer 30753-48-1
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(development of processing technol. for semiconductor **nanoparticled** formed in reverse micellar systems)

IT 1306-23-6, Cadmium sulfide, properties 1314-98-3, Zinc sulfide, properties
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)
(development of processing technol. for semiconductor **nanoparticled** formed in reverse micellar systems)

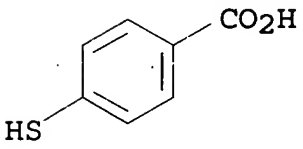
L119 ANSWER 30 OF 36 HCAPLUS COPYRIGHT 2005 ACS on STN
2001:130744 Document No. 134:357806 Lamellar Langmuir-Blodgett films of hydrophobized colloidal **gold nanoparticles** by organization at the air-water interface. Sastry, M.; Gole, A.; Patil, V. (Materials Chemistry Division, National Chemical Laboratory, Pune, 411 008, India). Thin Solid Films, 384(1), 125-131 (English) 2001. CODEN: THSFAP. ISSN: 0040-6090. Publisher: Elsevier Science S.A..

AB The organization of hydrophobically modified colloidal **Au nanoparticles** at the air-H2O interface and the formation thereafter of lamellar, multilayer films of the **nanoparticles** by the Langmuir-Blodgett (LB) technique is described. The hydrophobization of the Au colloidal particles was accomplished by the electrostatic extraction of carboxylic acid derivatized Au particles (synthesized in an aqueous medium, 35 Å in size) from solution into thermally evaporated fatty amine films by a simple immersion procedure. The acid-base complex formed by the association of the carboxylic acid groups bound to the colloidal particle surface and the amine groups in the lipid matrix gives a strongly-bound hydrophobic sheath of fatty amine mols. around the particles. The colloidal Au particles can thereafter be dissolved in different organic solvents, dried and redispersed repeatedly without significant aggregation of the Au particles. The

hydrophobic Au particles were dissolved in a spreading solvent and organized on the surface of H2O. The organization of the particles and the formation of multilayer films by the Langmuir-Blodgett technique was followed by surface pressure-area isotherm measurements of the colloidal particle Langmuir monolayer, quartz crystal microgravimetry, **UV**-visible spectroscopy and FTIR spectroscopy. A close-packed monolayer of the colloidal particles was formed on the surface of H2O and excellent multilayer films of the colloidal **nanoparticles** can be grown on different supports by sequential transfer by the LB technique.

IT **1074-36-8**
RL: MOA (Modifier or additive use); PRP (Properties); USES (Uses)
(lamellar LB films of colloidal **gold** **nanoparticles** hydrophobized by electrostatic attachment of ODA to surface-bound 4-CTP)

RN 1074-36-8 HCAPLUS
CN Benzoic acid, 4-mercapto- (9CI) (CA INDEX NAME)



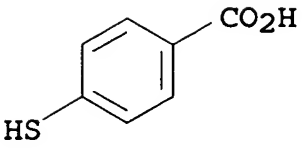
CC 66-1 (Surface Chemistry and Colloids)
ST lamellar Langmuir Blodgett multilayer hydrophobized colloidal **gold nanoparticle**
IT Hydrophobicity
Langmuir-Blodgett multilayers
Nanoparticles
(lamellar LB films of hydrophobized colloidal **gold** **nanoparticles** by organization at air-water interface studied using surface pressure-area isotherms, QCM, **UV** -visible, and FTIR)

IT 124-30-1, ODA
RL: MOA (Modifier or additive use); PRP (Properties); USES (Uses)
(ODA; lamellar LB films of colloidal **gold** **nanoparticles** hydrophobized by electrostatic attachment of ODA to surface-bound 4-CTP)

IT **1074-36-8**
RL: MOA (Modifier or additive use); PRP (Properties); USES (Uses)
(lamellar LB films of colloidal **gold** **nanoparticles** hydrophobized by electrostatic attachment

of ODA to surface-bound 4-CTP)
IT 7440-57-5, Gold, properties
RL: PRP (Properties)
(lamellar LB films of hydrophobized colloidal **gold nanoparticles** by organization at air-water interface studied using surface pressure-area isotherms, QCM, **UV**-visible, and FTIR)

L119 ANSWER 31 OF 36 HCAPLUS COPYRIGHT 2005 ACS on STN
2000:711057 Document No. 134:18159 Buildup of Polymer/**Au Nanoparticle** Multilayer Thin Films Based on Hydrogen Bonding. Hao, Encai; Lian, Tianquan (Department of Chemistry, Emory University, Atlanta, GA, 30322, USA). Chemistry of Materials, 12(11), 3392-3396 (English) 2000. CODEN: CMATEX. ISSN: 0897-4756. Publisher: American Chemical Society.
AB We report two new hydrogen-bonding-based routes for layer-by-layer fabrication of polymer/**Au nanoparticle** multilayer thin films. Two types of **Au nanoparticles** surface-modified with carboxyl groups or pyridine groups were prepared in nonaq. solvents. In the first assembly route, we consecutively adsorbed poly(4-vinylpyridine) (PVP) and **Au nanoparticles** with carboxyl group tailored surfaces. In the second route, we alternatively deposited poly(acrylic acid) (PAA) and **Au nanoparticles** with pyridine group tailored surfaces. The multilayer buildup was monitored by **UV**-vis spectroscopy, which showed a linear increase of the film absorbance with the number of adsorbed Au layers. FTIR spectroscopy was used to verify hydrogen bonding between the pyridine and carboxyl groups, which is believed to be the driving force for the formation of polymer/Au multilayer thin films.
IT **1074-36-8DP**, 4-Mercaptobenzoic acid, reaction products with teterachloroauric acid
RL: MOA (Modifier or additive use); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(**nanoparticle**; buildup of polymer/**Au nanoparticle** multilayer thin films based on hydrogen bonding)
RN 1074-36-8 HCAPLUS
CN Benzoic acid, 4-mercapto- (9CI) (CA INDEX NAME)



CC 38-3 (Plastics Fabrication and Uses)
Section cross-reference(s): 78
ST polyacrylic acid **gold nanoparticle** multilayer thin film hydrogen bond
IT Adsorbed substances
Hydrogen bond
Surface
(buildup of polymer/**Au nanoparticle** multilayer thin films based on hydrogen bonding)
IT Plastic films
(**nanocomposite**, layer-by-layer; buildup of polymer/**Au nanoparticle** multilayer thin films based on hydrogen bonding)
IT 9002-98-6
RL: NUU (Other use, unclassified); USES (Uses)
(buildup of polymer/**Au nanoparticle** multilayer thin films based on hydrogen bonding)
IT 9003-01-4, Poly(acrylic acid)
RL: POF (Polymer in formulation); PRP (Properties); USES (Uses)
(buildup of polymer/**Au nanoparticle** multilayer thin films based on hydrogen bonding)
IT **1074-36-8DP**, 4-Mercaptobenzoic acid, reaction products with teterachloroauric acid 16903-35-8DP, Tetrachloroauric acid, reaction products with mercaptobenzoic acid 25232-41-1DP, Poly(4-vinylpyridine), reaction products with teterachloroauric acid
RL: MOA (Modifier or additive use); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(**nanoparticle**; buildup of polymer/**Au nanoparticle** multilayer thin films based on hydrogen bonding)

L119 ANSWER 32 OF 36 HCAPLUS COPYRIGHT 2005 ACS on STN
2000:490080 Document No. 133:259173 **Photosensitization** of Thin SnO2 **Nanocrystalline** Semiconductor Film Electrodes with **Metallodiporphyrin.** Fungo, Fernando; Otero, Luis; Durantini, Edgardo N.; Silber, Juana. J.; Sereno, Leonides E. (Departamento de Quimica y Fisica, Universidad Nacional de Rio

Cuarto, Rio Cuarto, 5800, Argent.). Journal of Physical Chemistry B, 104(32), 7644-7651 (English) 2000. CODEN: JPCBFK. ISSN: 1089-5647. Publisher: American Chemical Society.

AB Sensitized **photocurrent** generation is observed with a porphyrin dyad (PZn-P) and its structural moieties: 5-(4-carboxyphenyl)-10,15,20-tris(4-methylphenyl) porphyrin (P) and Zn(II) 5-(4-carboxyphenyl)-10,15,20-tris(4-methylphenyl) porphyrin (PZn). The dyes were adsorbed to saturation on a **nanocryst.** SnO2 thin film, employed as working electrode in a photoelectrochem. cell. The metalized and unmetallized moieties possess different singlet state energies and redox properties. In both, solution and adsorbed state, nearly complete singlet-singlet energy transfer from the PZn to P has been determined in the dyad. PZn is less efficient than P in the **photocurrent** generation, but is a suitable energy donor in the dyad mol. The generation of photoelec. effects by the dyad is less effective in comparison with P. Considering the oxidation potentials of the two moieties in PZn-P, a mechanism is proposed where the oxidized metalized porphyrin enhances the back electron-transfer process.

CC 74-1 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
Section cross-reference(s): 72

ST porphyrin dyad **photosensitizer** tin dioxide electrode photoelectrochem electrochem; **photocurrent** generation porphyrin dyad **photosensitizer** tin dioxide electrode

IT **UV** and visible spectra
(absorption; **photosensitization** of tin dioxide film electrode with porphyrin dyad and its structural moieties)

IT **Photocurrent**
Photovoltage
(photoelectrochem. of ITO/SnO2 electrode sensitized with porphyrin dyad and its structural moieties)

IT Absorption spectra
Fluorescence
Fluorescence excitation
Photoinduced electron transfer
Singlet state transition
(**photosensitization** of tin dioxide film electrode with porphyrin dyad and its structural moieties)

IT 50926-11-9, ITO
RL: DEV (Device component use); USES (Uses)
(**photosensitization** of tin dioxide film electrode with porphyrin dyad and its structural moieties)

IT 18282-10-5, Tin dioxide

RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(**photosensitization** of tin dioxide film electrode with porphyrin dyad and its structural moieties)

IT 264879-25-6P
RL: PEP (Physical, engineering or chemical process); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); PROC (Process)
(**photosensitization** of tin dioxide film electrode with porphyrin dyad and its structural moieties)

IT 61449-63-6 73170-32-8 82498-08-6 91879-46-8
RL: PRP (Properties)
(**photosensitization** of tin dioxide film electrode with porphyrin dyad and its structural moieties)

IT 294673-19-1P
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(**photosensitization** of tin dioxide film electrode with porphyrin dyad and its structural moieties)

L119 ANSWER 33 OF 36 HCAPLUS COPYRIGHT 2005 ACS on STN
2000:35176 Document No. 132:157328 Formation of close-packed **silver nanoparticle** multilayers from electrostatically grown octadecylamine/colloid **nanocomposite** precursors. Patil, Vijaya; Sastry, Murali (Materials Chemistry Division, National Chemical Laboratory, Pune, 411 008, India). Langmuir, 16(5), 2207-2212 (English) 2000. CODEN: LANGD5. ISSN: 0743-7463. Publisher: American Chemical Society.

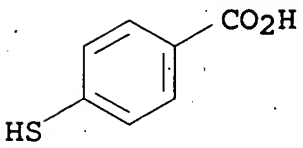
AB The formation of close-packed **Ag nanoparticle** thin films via a two-stage self-assembly approach is described. In the first step, surface-modified Ag colloidal particles are extracted from aqueous solution via electrostatic interactions into thermally evaporated fatty amine films. Thereafter, the excess fatty amine mols. in the organic matrix are removed by dissoln. in a range of organic solvents of varying dielec. properties. Thermogravimetric and quartz crystal microgravimetric studies indicate that, irresp. of whether the dissoln. medium is polar or nonpolar, except for a monolayer of amine mols. in direct contact with the colloidal particle surface, almost complete fatty amine dissoln. occurs leading to a considerable increase in the packing d. of the Ag colloidal particles. While **UV**-vis spectroscopy measurements of the films after amine removal suggest subtle differences in the final structure of the films prepared from the

different solvents, AFM studies show fairly aggregated colloidal particle structures in all cases.

IT **1074-36-8**, 4-Carboxythiophenol
RL: MOA (Modifier or additive use); USES (Uses)
(preparation of close-packed **silver nanoparticle** multilayers from octadecylamine/carboxythiophenol-modified **Ag** colloid **nanocomposite** precursors)

RN 1074-36-8 HCAPLUS

CN Benzoic acid, 4-mercapto- (9CI) (CA INDEX NAME)



CC 66-4 (Surface Chemistry and Colloids)

ST **silver nanoparticle** multilayer prepn octadecylamine **silver** colloid **nanocomposite**

IT Microstructure
(of close-packed **silver nanoparticle** multilayers prepared from octadecylamine/**Ag** colloid **nanocomposite** precursors)

IT Absorption spectra
Colloids
Multilayers
Nanocomposites
Nanoparticles
Solvent effect
(preparation of close-packed **silver nanoparticle** multilayers from octadecylamine/**Ag** colloid **nanocomposite** precursors)

IT 124-30-1, n-Octadecylamine
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(preparation of close-packed **silver nanoparticle** multilayers from octadecylamine/**Ag** colloid **nanocomposite** precursors)

IT 7440-22-4, Silver, properties
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(preparation of close-packed **silver nanoparticle** multilayers from octadecylamine/**Ag** colloid **nanocomposite** precursors)

IT **1074-36-8**, 4-Carboxythiophenol
RL: MOA (Modifier or additive use); USES (Uses)
(preparation of close-packed **silver nanoparticle** multilayers from octadecylamine/carboxythiophenol-modified **Ag** colloid **nanocomposite** precursors)

IT 56-23-5, Carbon tetrachloride, properties 64-17-5, Ethanol, properties 67-64-1, Acetone, properties 71-43-2, Benzene, properties
RL: PRP (Properties)
(solvent; preparation of close-packed **silver nanoparticle** multilayers from octadecylamine/**Ag** colloid **nanocomposite** precursors by immersion in)

L119 ANSWER 34 OF 36 HCAPLUS COPYRIGHT 2005 ACS on STN
1999:766465 Document No. 132:114367 Electrochemical and Spectroscopic Studies of Nitrophenyl Moieties Immobilized on **Gold Nanoparticles.** Chen, Shaowei; Huang, Kui (Department of Chemistry and Biochemistry, Southern Illinois University, Carbondale, IL, 62901-4409, USA). Langmuir, 16(4), 2014-2018 (English) 2000. CODEN: LANGD5. ISSN: 0743-7463. Publisher: American Chemical Society.

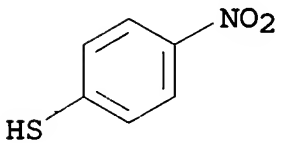
AB Electrochem. and spectroscopic studies of gold nanoclusters passivated by a mixed monolayer of n-hexanethiolates (C6S) and p-nitrothiophenolates (NTP) are reported. Multiple copies of NTP were incorporated into the cluster monolayers by a surface exchange reaction, where the final surface composition was determined by 1H NMR, and further characterized by IR (FTIR) study. **UV**-visible spectroscopic study of the exchanged particles showed a surface-plasmon (SP) band position at .apprx.504 nm. The blue shift of the SP energy relative to that of the (unexchanged) hexanethiolate-protected clusters, 520 nm, was attributed, in part, to the interactions between the gold cores and the nitrophenyl functional groups. Electrochem. measurements of the cluster solns. in dried CH2Cl2 exhibited two (quasi-)reversible voltammetric waves within the potential range of -1.0 to -1.6 V (vs. Ag/AgCl), which were ascribed to the successive single-electron-transfer processes related to the nitrophenyl moieties, with the corresponding reduction products being the anion radical and dianion, resp. In the potential range of +1.0 to -0.8 V, multiple reversible voltammetric waves were observed, which were interpreted based on the quantized capacitance charging of **nanoparticle** double layer. The peak spacings decrease slightly compared to those without NTP exchange, corresponding to a small increase of the particle capacitance due to the more polar

NTP ligands.

IT **1849-36-1**, p-Nitrothiophenol
RL: PEP (Physical, engineering or chemical process); PRP (Properties); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(electrochem. and spectroscopic studies of gold nanoclusters passivated by mixed monolayer of hexanethiolates and p-nitrothiophenolates)

RN 1849-36-1 HCAPLUS

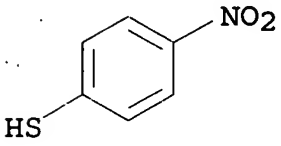
CN Benzenethiol, 4-nitro- (9CI) (CA INDEX NAME)



IT **174848-05-6**
RL: FMU (Formation, unclassified); PRP (Properties); FORM (Formation, nonpreparative)
(formation in electrochem. reduction of nitrothiophenol in mixed monolayer of hexanethiolates and p-nitrothiophenolates on gold nanoclusters in dried CH2Cl2)

RN 174848-05-6 HCAPLUS

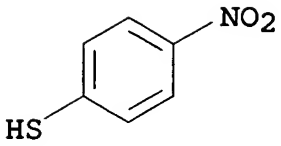
CN Benzenethiol, 4-nitro-, radical ion(2-) (9CI) (CA INDEX NAME)



IT **174741-23-2**, p-Nitrothiophenol radical ion(1-)
RL: FMU (Formation, unclassified); PRP (Properties); RCT (Reactant); FORM (Formation, nonpreparative); RACT (Reactant or reagent)
(formation in electrochem. reduction of nitrothiophenol in mixed monolayer of hexanethiolates and p-nitrothiophenolates on gold nanoclusters in dried CH2Cl2)

RN 174741-23-2 HCAPLUS

CN Benzenethiol, 4-nitro-, radical ion(1-) (9CI) (CA INDEX NAME)



CC 72-2 (Electrochemistry)
Section cross-reference(s): 22, 66

ST electrochem spectroscopic study nitrophenyl moiety immobilized **gold nanoparticle**; electroredn nitrothiophenol mixed monolayer hexanethiol **gold nanoparticle**

IT Surface plasmon
(**UV**-visible spectrum of gold nanoclusters passivated by mixed monolayer of hexanethiolates and p-nitrothiophenolates in relation to)

IT **Nanoparticles**
(electrochem. and spectroscopic studies of nitrophenyl moieties immobilized on **gold nanoparticles**)

IT **UV** and visible spectra
(of gold nanoclusters passivated by mixed monolayer of hexanethiolates and p-nitrothiophenolates in THF)

IT Electric capacitance
(of **gold nanoparticles** with mixed monolayer of hexanethiolates with nitrothiophenolates)

IT **1849-36-1**, p-Nitrothiophenol
RL: PEP (Physical, engineering or chemical process); PRP (Properties); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(electrochem. and spectroscopic studies of gold nanoclusters passivated by mixed monolayer of hexanethiolates and p-nitrothiophenolates)

IT **174848-05-6**
RL: FMU (Formation, unclassified); PRP (Properties); FORM (Formation, nonpreparative)
(formation in electrochem. reduction of nitrothiophenol in mixed monolayer of hexanethiolates and p-nitrothiophenolates on gold nanoclusters in dried CH2Cl2)

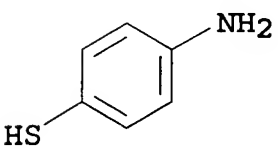
IT **174741-23-2**, p-Nitrothiophenol radical ion(1-)
RL: FMU (Formation, unclassified); PRP (Properties); RCT (Reactant); FORM (Formation, nonpreparative); RACT (Reactant or reagent)
(formation in electrochem. reduction of nitrothiophenol in mixed monolayer of hexanethiolates and p-nitrothiophenolates on gold nanoclusters in dried CH2Cl2)

L119 ANSWER 35 OF 36 HCAPLUS COPYRIGHT 2005 ACS on STN
1999:584487 Document No. 131:304656 Adsorption Kinetics of **Au** and **Ag Nanoparticles** on Functionalized Glass Surfaces. Park, Sung-Ho; Im, Jung-Hyuk; Im, Jun-Wan; Chun, Byung-Hoon; Kim, Jae-Ho (Department of Applied Chemistry, Ajou University, Suwon, 442-749, S. Korea). Microchemical Journal, 63(1), 71-91 (English) 1999. CODEN: MICJAN. ISSN: 0026-265X. Publisher: Academic Press.

AB Well-defined two- or three-dimensional arrangements of nanosize Au and Ag particles were fabricated for surface-enhanced Raman scattering substrate applications and their unique optical properties. Two-dimensional arrays of colloidal films of Au and Ag were prepared on glass slides modified with silane compds. having bifunctional moieties that have specific affinity for Au or Ag. During the formation of colloidal films of Au and Ag on glass slides, **UV**-visible absorption spectroscopy was used to monitor the progress of the surface immobilization reaction of colloidal particles on solid substrates. Adsorption characteristics could be accurately modeled by the known Michaelis-Menten kinetics. The k3/k1 values were proportional to particle size. The rate of formation of the 1st monolayer with relatively small particles is faster than that of the multilayers, whereas for larger colloids the multilayer formation rate is much faster. SERS spectra of p-aminothiophenol (PATP) on a Ag colloidal film were obtained with 514.5-nm excitation. SERS intensities of PATP increased significantly with morphol. change of the colloidal film. This morphol. alteration, parallel to H2O evaporation from the colloidal film, was presumably induced by the difference in dielec. consts. of air and H2O. (c) 1999 Academic Press.

IT **1193-02-8**, p-Aminothiophenol
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(SERS of aminothiophenol on glass with **metal nanoparticles**)

RN 1193-02-8 HCAPLUS
CN Benzenethiol, 4-amino- (9CI) (CA INDEX NAME)



CC 73-3 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 66
ST adsorption kinetics **gold silver** **nanoparticle** functionalized glass surface; Raman **UV** spectra **nanoparticle** colloid adsorbed
IT Adsorbed substances
Adsorption
Adsorption kinetics
Colloids
Nanoparticles
SERS (Raman scattering)
Size effect
Surface structure
UV and visible spectra
(adsorption kinetics of **Au** and **Ag** **nanoparticles** on functionalized glass surfaces)
IT **1193-02-8**, p-Aminothiophenol
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(SERS of aminothiophenol on glass with **metal** **nanoparticles**)
IT 4420-74-0 7440-22-4, Silver, properties 7440-57-5, Gold, properties 13822-56-5, Aminopropyltrimethoxysilane
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(adsorption kinetics of **Au** and **Ag** **nanoparticles** on functionalized glass surfaces)
IT 7761-88-8, Silver nitrate, reactions 16903-35-8, Tetrachloroauric acid
RL: RCT (Reactant); RACT (Reactant or reagent)
(adsorption kinetics of **Au** and **Ag** **nanoparticles** on functionalized glass surfaces prepared using)

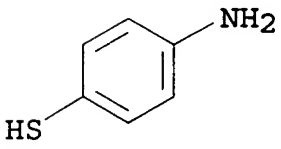
L119 ANSWER 36 OF 36 HCAPLUS COPYRIGHT 2005 ACS on STN
1999:527955 Document No. 131:264062 Surface enhanced Raman scattering in the near infrared using metal nanoshell substrates. Oldenburg, Steven J.; Westcott, Sarah L.; Averitt, Richard D.; Halas, Naomi J. (Rice Quantum Institute, Center for Nanoscale Science and Technology, Department of Electrical and Computer Engineering, Rice University, Houston, TX, 77005, USA). Journal of Chemical Physics, 111(10), 4729-4735 (English) 1999. CODEN: JCPSA6. ISSN: 0021-9606. Publisher: American Institute of Physics.

AB A metal nanoshell is a composite **nanoparticle** consisting of a dielec. core coated by a thin metal shell; its peak plasmon resonance wavelength is determined by the ratio of the core diameter to the shell thickness. When p-mercaptoaniline (p-MA) is in solution with Au nanoshells that have their plasmon resonance near a 1.06 μm excitation source, significant surface enhanced Raman scattering (SERS) is observed The strongest Raman enhancements are obtained when enough Au is deposited on the SiO2 cores to form a nearly complete metal shell. Correlations between TEM-defined structure, **UV**-visible spectra, SERS signal strength, and electromagnetic theory show that the SERS signal is due to both the local enhancement of the dielec. field via the plasmon resonance of the **nanostructure** and to the localized regions of high field intensity provided by the nearly completed Au shell. Comparison with SERS enhancements on completed nanoshell structures indicates the relative contribution of these 2 effects.

IT **1193-02-8**, p-Mercaptoaniline
RL: PRP (Properties)
(surface enhanced Raman scattering in near IR using metal nanoshell substrates)

RN 1193-02-8 HCAPLUS

CN Benzenethiol, 4-amino- (9CI) (CA INDEX NAME)



CC 73-3 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

ST surface enhanced Raman NIR metal nanoshell; **gold** **nanoparticle** silica dispersed

IT Composites
Nanoparticles
Nanostructures
Plasmon
Quasiparticles and Excitations
Resonance
SERS (Raman scattering)
UV and visible spectra
(surface enhanced Raman scattering in near IR using metal

nanoshell substrates)

IT **1193-02-8**, p-Mercaptoaniline 7440-57-5, Gold, properties
7631-86-9, Silica, properties
RL: PRP (Properties)
(surface enhanced Raman scattering in near IR using metal nanoshell substrates)

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